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JOURNAL OF EDUCATIONAL RESEARCH

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JOURNAL *of* EDUCATIONAL RESEARCH

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OUR GENERAL OUTLOOK ON ARITHMETIC

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WHAT IS NUMBER?

IT is not enough to say, in response to the above query, "Oh, such things as 2, 3, 7 are numbers." There is a demand upon us to deal a little more fundamentally with this question, to inquire more fully into the nature of number. Such an inquiry is commonly regarded as an excursion into "philosophy," but it seems best to avoid this term and refer to the inquiry as a procedure of analysis.

Importance of a theory of number.—The purpose of such an analysis is to formulate, if possible, an acceptable theory regarding the nature, genesis, and function of number in human experience. For those who think that an inquiry of this type cuts no ice or bakes no bread in the general economy of human affairs, there is a ready answer. One's fundamental notions of things affect one's behavior towards them, one's action in regard to them. The fundamental notions of educational leaders about the general place of number in the experience of man furnish the platform from which they talk to us about the teaching of arithmetic. When one of these leaders suggests that the objective of arithmetic is the cultivation of skill, the mastery of tools, the development of intelligence, the acquisition of generalizations, the accumulation of information, or success in business, watch him carefully, for he is indicating a range or an emphasis for the subject, that is probably determined by the aforesaid platform and may be questionable.

A current theory of number.—The nature of number is still beclouded with much uncertainty. In the present state of knowledge we are dealing with assumptions, when a question arises in regard to the fundamental nature of number. And since a difference in assumptions is usually followed by a difference in consequences, as intimated above, the intelligent educator will canvass the possibilities in the way of assumptions, and proceed according to that assumption which seems most consistent with the body of belief to which he holds.

It would be exciting, if not refreshing, to devote the remainder of this paper to an examination of a theory of number around which a 1937 book on the teaching of arithmetic has been written. A few statements from the Preface will give the reader an idea of the theory and the importance of weighing assumptions.[1]

> There appears to exist among teachers of arithmetic in the schools and among writers upon the teaching of arithmetic the belief that number is to be found in the world of things and of experiences and of practical affairs, and that all one needs to do to lead children to the discovery of number is to bring them into contact with objects and experiences and situations. The belief expresses itself in the prevailing methods of introducing the procedures of arithmetic to children. Thus, to introduce the activity of counting, children are surrounded with objects which must be attractive enough to gain attention; . . . The belief suggests that arithmetic is part of the material world in which children live, and that it may be extracted by them in proportion to their contacts with the material world.
>
> One of the major purposes of this book is to combat such belief. Although number may be applied to everything in the world, it exists nowhere in the world. The world does not itself possess number; the world has been invaded by trained minds which have been equipped with number.

The second paragraph is indeed a very startling piece of cogitation. If the world does not possess number, what does? The contention is, of course, that minds possess number—just as if mentality were not a part of this world of ours. The thinking is in terms of the old mind-matter dualism and number is regarded as a mental construct that is in some way clapped by the mind on physical existents. The opponents of this view, on the contrary, find the source of all concepts, including the numerical, in the natural world. The content of concepts is first given, they believe, in sensory experience. According to this view, the terms or symbols of the number system originally represent existent aspects of the objective world. In a word they stand for facts of order and magnitude, and their relations, among which equality and similarity are prominent. The defender of the latter view, accordingly, does not condemn, as the author of this book does, the educator who teaches that "fivesness" can be abstracted from a concrete situation. He supports such an educator, because the latter seems to be looking in the place where the content of all basic concepts is originally located. This does not mean that arithmetical conceptions are not applied to concrete situations. The contention is that they

[1] Wheat, Harry Grove. *The Psychology and Teaching of Arithmetic* (Boston: D. C. Heath and Company, 1937), Preface.

are first derived from such situations, then later applied in similar situations. The development of arithmetical ideas is first inductive, then deductive.

Qualities of things come in amount.—What is actually known about number is a matter of experience. From this point of view the objects of knowledge, the things we know, are, more definitely, complexes of experience. The psychologist speaks of complexes of sensations. An apple as we perceive it is such an object. It is analyzable into several different types of experience. It is red, smooth, cool, sweet, heavy. The adjectives used refer to *qualities* of the apple. Who hasn't learned that an adjective is a word used to express quality? Indeed for us the apple is the sum of its qualities put together in a certain arrangement. Now, note the next point carefully: Every quality comes in some amount, which is the same as saying, in impressive phraseology, that it has a quantitative aspect. We recognize this fact in everyday experience when we refer to some apples as redder than others, smoother or sweeter than others; and no harm is done to the argument if cheeks are substituted for apples in the comparison.

Number as measurement of amount.—Things, then, are complexes of qualities, and qualities always exist in the more-less dimension. Moreover, the demand or desire for the things of this world is closely associated with amounts of quality. The redder the apples, the more *attractive*, ordinarily; the greener, the less attractive. The word "attractive" is just another way of expressing desire or demand. In view of the close connection between quantity and demand, the need arises for more accurate knowledge of amount. To know that one orange is heavier than another is important for the housewife who serves orange juice for breakfast. To know that the Jones farm is larger than the Smith farm is important, if one is asked to pay more for it. But such ideas of amount have a limited helpfulness because of their crudity. They may be regarded as representing a gross kind of measurement, or expression of amount. Thus one understands the encouragement that has been given to the invention of instruments that provide more accurate measures of amount—instruments for determining the amount of weight (scales) or length (yard stick) or temperature (thermometer) of things. It should be observed that all these instruments of measurement are made on the principle of expressing amount in *number* of units—weight in *number* of pounds, length in *number* of yards, and temperature in *number* of degrees, or in some fraction or multiple thereof. It may now be plausibly argued that number in

its first intent in concrete experience is fundamentally an expression of the frequency of units of some kind, represented by different strokes of attention in discriminating things. Even the primitive counting of sheep by tieing knots or by dropping pebbles can easily be understood as a method of measuring, a method of determining the number of units—in this case individuals—in a flock.

Development of a number language.—The measuring just described could be conducted without number names for different amounts, without a name to express the total. One might simply point to the knots or the pebbles corresponding to the total. A name for the number, however, is obviously convenient. The development of a number language is no more mysterious than the development of language in any other area of life. It is demonstrably convenient to label or ticket an object of knowledge, to use a symbol for it, as "dog" for a certain kind of hairy quadruped, and "cat" for his immemorial enemy. In the same way "1" comes to be used for a single unit of anything, "2" for one more than a single unit, "3" for one more than that, and so on. According to this view, number symbols, the "figures" we write, are signs or terms which stand, in our language or thought, for realities in experience. A number is a human invention; the amount for which it stands is an objective fact. The number *system*, with its arbitrary decimal arrangement, is in essence an abstraction from reality; it is an organization of concepts, symbolized as described, that take their origin in the realm of particular experience. One can get so involved in and fascinated by the abstract elements in this system and their inter-relations that one forgets their earthly origin and comes to believe that they exist in an exalted realm divorced from everyday affairs. Abstractions do have a way of getting divorced from their perceptual mates, but originally the two kinds of experiences appear in a perfect state of matrimony. All concepts, including number concepts, are derivatives of the perceptual world, or expressions of the relations of such derivatives, and are chiefly valuable for guidance as we dip further into the stream of life's particulars.

The views of James and Einstein.—This theory not only reflects the insight of William James, but is clearly consistent with the research technique of a more recent genius, Albert Einstein. Professor Einstein is a theoretical physicist who begins with certain experimentally established concepts, propositions, or equations; projects a conclusion or suggests an hypothesis based on a mathematical study of the relations between these concepts; and then looks about for a way of verifying his hypothesis in

the stream of life's particulars. In one instance the verification is found by an application of the hypothesis in a study of the orbit of the planet Mercury; in another it is found in the discovery that rays of light are bent as they pass the sun.

CONCRETE AND ABSTRACT WORK

On the basis of such a general theory, let us now glance for a moment at some of the troublesome problems regarding the nature of our subject and the method of teaching it.

If a child picks up two colored sticks, then two more, and reports that he has four sticks, the number work would be called concrete. If, however, the teacher places before the child the combination, $\frac{2}{2}$, and asks him to add, the example would be called abstract. It is abstract because each of the numbers is divorced from any *particular* content and represents a generalized value. Conservative schools tend to go to seed in the direction of the abstract, radical schools in the direction of the concrete. It is a mistake in any subject to proceed as if the generalizations of experience, the abstractions therefrom, can be taught successfully apart from the perceptual situations in which they originate. The instructional formula is percept to concept and back to percept again. It is procedure from a real problematic situation to a thoughtful conclusion and back to everyday life again for verification and use. This means induction followed by deduction. It means generalization from the facts and the later use of the generalization as a guide in behavior. Since, however, no one is mathematically skillful who cannot think numerical values abstractly and no one is mathematically trained who cannot perform the essential operations with abstract numbers, it is easy to see that neglect of either phase is to be deplored. The real problem is to determine the proper balance between the two aspects. It seems certain today that abstract work is generally overdone, to the neglect of the concrete, particularly in the lower grades.

COMPUTATION AND PROBLEM-SOLVING

Not unrelated to the preceding problem is that concerning the relative importance of computation and problem-solving in arithmetic. The same problem is encountered on the psychological level when one asks whether habit or reasoning should predominate. The problem is again precipitated by one who belittles the formation of skills and exalts the importance of generalizations.

Getting our cue from life.—If one again goes back to human experience for his bearings, it can be seen that all investigation, all research, all thinking originates in some kind of problem. One does not think without cause, without a stimulus or situation which is challenging, perplexing, and therefore thought-provocative. Such a situation is commonly referred to as a problematic situation, or merely as a problem. Problems come first, then attempts to solve them. Proper attempts at solution are acts of thinking, answers to the question, What is to be done to escape the perplexity? Several proposals, plans, ideas, hypotheses, are ordinarily considered by a proficient thinker before one is acted upon, and whether the accepted hypothesis is correct can usually be determined only by trying it out, as we say, in everyday life; or by experiment, to use the language of science. From this point of view, life is a series of problems and ensuing attempts at solution, while education is an organized means of assistance in problem-solving.

Two separate abilities.—In the light of this hypothesis, let us revert to computation and reasoning in arithmetic. The word "computation" refers to the handling of arithmetical processes, to the correct manipulation of abstract numbers. This is ultimately reducible to ability to do four things in arithmetic: add, subtract, multiply, and divide. If one can perform these four fundamental operations with integers, common fractions, decimal fractions, and denominate numbers, he is trained in the arithmetical computation of the schools. The reasoning problem arises in determining when to add, subtract, multiply, or divide. To solve a real problem in arithmetic a pupil must know, first, what to do, and second, how to do it. In connection with the first arises the great demand for reasoning, or thinking, or problem-solving ability; in connection with the second, the demand for ability to compute. Extensive correlation studies, though available, are unnecessary to convince one that a pupil may be able to compute satisfactorily without being competent in arithmetical reasoning, and *vice versa*, a fact which indicates that two general abilities, largely disparate, are involved. In other words, the two kinds of ability under discussion are necessary for arithmetical competence, hence both should be trained. The point in dispute, therefore, again turns out to be one of relative value. The writer recalls, with no particular enthusiasm, an experience he had in a class of teachers-in-service which he was conducting a number of years ago. One day he propounded a question regarding the relative importance of the two abilities mentioned and requested an expression of opinion from the class. The teachers responded

without hesitation, but they were so nearly unanimously in favor of giving computation the greater emphasis that the instructor, in spite of a different opinion, merely made an innocuous comment on the vote and then steered his bark into less turbulent waters. That was yesterday.

Why the extreme emphasis on computation?—The vote of the teachers referred to, however, was consistent with a trend that still persists with great force, a trend that has been encouraged by the demands of the commercial world for clerks who can carry the heavy burdens of routine computation, after most of the real problem-solving has been done; by the makers of standardized tests, who have given much more attention to the development of computation tests than to tests of arithmetical-reasoning ability; and, indirectly, by writers on the teaching of arithmetic, who have had little to offer teachers on problem-solving. Ten books on the teaching of arithmetic were found, on examination, to devote only six percent of their space to instruction on problem-solving. From which it seems obvious that the marked emphasis of teachers on computation is largely due, on the one hand, to commercial pressure, and, on the other, to professional neglect. The latter is not entirely the fault of the makers of tests and the writers of professional books. The difficulty is traceable to the relative dearth of knowledge regarding arithmetical reasoning. Teachers have been given little help by their leaders because little has been available to give. In recent years, however, the situation has begun to look somewhat more promising. Investigators in larger numbers are turning to this dark corner of arithmetic, and are reporting significant results. The indications are that we may have, relatively soon, a considerable body of authenticated information for the guidance of instruction in the field of arithmetical reasoning.

Is the value of problem-solving underestimated?—It is not certain, however, that teachers would just now sufficiently emphasize problem-solving in arithmetic, even if they knew more clearly the methods to pursue. There is still a question regarding the relative value of computation and problem-solving. Perhaps there is a connection between the limited progress of experts and underestimation of the value of problem-solving. If so, it is time to reconsider the prevailing evaluation of this aspect of arithmetic.

The present trend toward intellectual training.—The present trend in education is in the direction of improving the school as a means of training intelligence. This movement has received impetus from many directions. The near collapse of our civilization since the World War

has made it clearer than ever before, that our most precious ability and our chief hope of social salvation is intelligence. Our present bewilderment bears eloquent testimony to the scarcity of this much needed commodity. Otherwise we should not stand so tragically helpless in the face of so many challenging social problems. The contemporary social confusion, however, is not the only evidence of the need for better training of our people in ability to reason, to think, to solve the problems of life. The demand comes directly from many educational leaders regardless of difference of opinion on other issues. It can be truthfully said that nothing more deeply animates the group of educators led by Professor Dewey than a desire (it amounts to a passion) so to organize the schools that training in reflective thinking will become the central aim. Indeed the domination of this aim in the minds of some of this group is so marked that it throws the habitual and more or less mechanical elements of an education into the shadow of neglect. Professor Judd's disparagement of "trivial skills" and his marked emphasis on the achievement of important generalizations is in the same general direction, for such generalizations are the product of the best intellectual efforts of the past and the only rational starting point for thinking in the present. In other words, things are conspiring generally to make the classroom a better training ground in reflective thinking. Since this is true for the school in general, it should be especially true for the work in arithmetic, for this subject offers a superb opportunity, perhaps the best, for training in thinking.

The influence of an earlier period.—Neglect of this opportunity offered in arithmetic has been characteristic of the teaching of the subject since the latter half of the nineteenth century, when drill became the watchword and arithmetic settled down into a state of general stagnation. The situation at that time has been interestingly described by a writer near the end of the period. "Arithmetic," he remarked, "has thus become a science of difficult trifles and intricate fooleries peculiar to common schools, and remarkable chiefly for sterility and ill-adoptness to any useful purpose." The arithmetics of that period represented a striking departure from earlier books such as Colburn's which contained little in the way of abstract examples and was practically filled with verbal problems. In recent years, however, the pendulum has been swinging back in the earlier direction. It is now being more insistently demanded that teachers seize the opportunity offered in arithmetic to improve thinking ability, without neglect of training in essential computational skills. The

latter are important in life, but they are important as means of solving problems. The deferred answer, then, to the teachers who voted so strongly against the writer is that training of intelligence should take precedence over training in computational skills.

MATHEMATICAL ABILITY AND SOCIAL INFORMATION

In certain quarters it is now being suggested that the informational aim should be given greater recognition in arithmetic. The suggestion looks for support to a recent enterprise in the field of the social studies. A number of pamphlets has been prepared by a responsible organization, each designed to acquaint the child with an important social institution. Several of the institutions described, such as the use of Arabic numerals, ways of telling time, and systems of weights and measures fall within the province of arithmetic.

Cultivating acquaintance with social institutions.—Few will question the view that each of the social usages mentioned is of fundamental importance and that a large part of the teacher's general job is the cultivation of acquaintance with social institutions. This is implied in the content of aim in education. A difference of opinion arises, however, concerning the method of doing this. It must be borne in mind that the main interest of the committee in charge of this work was the development of social understandings and attitudes in social science, and was only indirectly concerned with arithmetic. One almost infers, after reading a recent appeal for informational arithmetic, that we are about to embark on a program of making arithmetic an adjunct of the course in the social studies.

Every subject of study can be conceived as a means of inducting the pupil into the ways (practices, institutions) of social life. In more stereotyped phrase, this objective is spoken of as preparation for effective participation in social life. Arithmetic as a subject has to do with the institution of number in social life, and the *processes* of arithmetic are an essential and technical part of this institution. In the past, as has been pointed out, teachers have been so intensely interested in developing skill in these processes that relatively too much attention has been given to the mechanical aspect of the subject, too little to the improvement of ability to think. Now what of the suggestion that another claimant for favor be admitted to a richer berth in the arithmetic course?

Informational possibilities in arithmetic.—The materials prepared by the committee referred to is mostly historical in nature. It deals with

the genesis of certain modern usages. If social science is a study of social institutions and history contributes to an understanding of these institutions, then obviously this material has a place in the social-studies course. The question before us, however, relates to the extent to which such historical material should be imported into arithmetic. When children encounter the plus sign for the first time in this subject, should it be made a part of the course to find out where the sign came from? Now, admittedly, this sign is as interesting historically as the buttons on the sleeve of a man's coat. It goes back to the little Latin word, *et*, which means "and." In handwriting, the word *et* became conventionalized in the form (&) and was further simplified into the mathematical sign (+) of addition. Let us take another symbol—the word "window." What is the origin of this word? Few educated people know, despite the fact that "window," either the word of the thing for which it stands, is an important social institution. Speaking more broadly, the question arises as to whether any considerable portion of the time allotted to arithmetic should be devoted to the connotation and genesis of unfamiliar political, economic, geographical, architectural, and other concepts. Indeed, the informationalist at times goes further and extenuates the use of difficult terms in statements of problems and explanations of processes as a means of vocabulary expansion. In other words, he proposes to use the arithmetic period directly for the teaching of English. At this point the theory seems to have reached its limit in a *reductio ad absurdum* and runs counter to one of the most conspicuous and defensible trends in modern arithmetic—that toward the elimination of all unnecessary linguistic difficulties.

Defining the field of arithmetic.—Opinions may differ as to whether children, urban children for example, should be given problems involving the area of a gable, the contents of a silo, the size of a corral, or the construction of an adobe wall. Informationalists would use the arithmetic period as an occasion for the cultivation of ideas over a broad domain. The writer, on the contrary, stresses the value of concentration. He would make a concerted attempt to locate the important arithmetical processes in *familiar* social situations, and, wherever possible, familiar to the child. Where he goes beyond the range of the child for material, he does so to include an arithmetical process in common adult demand or an adult situation to which an arithmetical process is commonly applied. Even this will probably be regarded by many champions of the child-centered school as an undesirable concession to the preparation-for-life objective. The

most difficult subject in the curriculum, and one of the most important in life, requires concentration on quantitative material. It requires intensity of analysis, rather than extensity of experience. Moreover, the quantitative aspects of a familiar situation are naturally easier to grasp than those of an unfamiliar situation, a fact which means that a problem in such a setting is more likely to be understood. In other words, the curriculum problem is to bring important samples of social life under the arithmetical microscope in a manner to facilitate the development of ability to do quantitative thinking. Everyone is in favor of enrichment and breadth of information, but this aim, worthy as it is in its place, must not be permitted to interfere with the fundamental objective, the development of mathematical intelligence and technique. The arithmetical enrichment of first importance in the elementary school is that which comes with the consciousness of number in a situation otherwise familiar, but in which number relations have not previously been sensed. The course built on the principle advocated introduces the child to number in thousands of important social situations and at the same time keeps first things first. The objective is arithmetic for citizenship, not social information as a substitute for arithmetic. If one wants to learn about a number of things let him travel around the world or take a course in the social studies. If he wants to learn about the number *in* things, let him first get down analytically to number in familiar events.[2]

The informational aim in percentage.—The informational aim is afforded its greatest opportunity in the field of percentage, for the problem there is one of application of a familiar arithmetical process to situations not yet familiar. After the elements of percentage have been taught in familiar areas, that is, after the "percentum" idea has been acquired and the concepts of base and rate are understood, there is a long series of topics in which no new arithmetical content is encountered. The series includes profit and loss, commission, interest, discount, stocks and bonds, and taxes. What is new is subject matter in economics rather than in arithmetic. The difficulty in these topics is not in understanding the calculation, but in understanding the social usage. Be it noted that there is no importunate demand at the elementary-school level for the history of the stock market or the banking business. The demand is for knowledge of these institutions as they function today. Incidental

[2] The discussion of the informational aim is considered throughout in relation to arithmetic when taught in a subject curriculum. The point which we are urging, however, is no less important in a project curriculum. Intensity is more important than extensity of experience in the approach to mathematical competence.

touches of history will prove an attraction; more than that, a distraction.

Need for knowledge of social practices.—The necessity for including these topics somewhere in the curriculum is obvious. For example, a corporation bond is an important social institution of a definite type. How can one deal with its quantitative aspects when one has no clear comprehension of *it?* Without a comprehension of the things with which one deals one is like a man trying to estimate the possibilities of profit in a goat ranch when he knows neither what nor how much the animals eat; when he knows not the extent to which their milk is prized for food, their hides for shoes, their hair for the cushiony interior of motor cars. The nature of bonds should be taught somewhere, and traditionally, the subject of arithmetic has had the call over the social studies. If, however, the social studies will guarantee to provide pupils with practice in the applications of percentage, many of us will be glad to turn over the topics under discussion to them after the percentage process has been taught. This would be consistent with the theory of junior-mathematics, according to which much of the social material ordinarily introduced in the seventh and eighth grades is regarded as a digression from the main mathematical highway.

A bifurcation of the course.—Beyond the sixth grade two kinds of courses are in operation in arithmetic. In one sense they are competitive; in another, complimentary. The junior course carries the pupil forward with less delay in mathematics; the other provides more extensive training in the social applications of arithmetic. The relative value of these courses cannot be determined apart from the vocational purposes of the pupils. There seems to be no good reason why both types of course should not be offered, even in the same high school. Indeed, the same series of arithmetics might branch off in two directions after the sixth grade, on the one hand in the direction of social applications and, on the other hand, in the direction of mathematical advancement.

SOCIAL UTILITY AND THE COURSE IN ARITHMETIC

In the selection of material for the course in arithmetic, some very fundamental problems in curriculum making naturally arise. Probably the most important of these relates to the use of the principle of social utility as a guide.

Investigations of social usage.—Until recently this principle was esteemed quite generally among educators as the final arbiter in the selection of curricular content. Today there is increasing doubt of it adequacy

as the sole determiner of this content. The situation in the field of fractions will serve as an illustration. The fractions found by investigators of social usage are next to the fundamental operations with integers in frequency, but they are so small and the operations so simple as to suggest a much reduced emphasis on fractions in the elementary schools. No outstanding textbook maker, however, has had the temerity to limit the work in fractions to the dimensions suggested by these samplings of social usage. Indeed, there is now under way a distinct tendency to depart somewhat from these meager cross-sections of social life, first, because the validity of the investigations is at various points impugned, and, second, because social usage alone is not regarded as a sufficient criterion for the selection of subject matter. When but two corporations out of several hundred whose stock is listed on the New York Stock Exchange have nearly a million stock holders, it is evident that millions of people[2] in the United States buy stocks and hence should know the arithmetic pertaining to their purchase and sale, yet at least two social-usage investigations have reported no problems relating to either stocks or bonds. This is an example of an invalid finding, which evidently results from the fact that the methods of investigation were not of a character to obtain a truly representative sampling of arithmetical usage.

Conservative nature of the principle.—The second criticism amounts to an attack on a fundamental assumption on which the research has been based. The critics are not content to accept the practices of everyday life as the only guide in formulating their objectives. They believe that the schools have a duty not only to prepare for life as it is, but also to raise the level of present practice. Schools exist to improve as well as to preserve our institutions. If one were commissioned to prepare a course of study in morals, should he be content to accept the practices of present adult life as the standard for pupil performance? The answer is obviously negative. As regards fractions, the argument is that the schools should equip the child to use the processes in this field in many situations where they are helpful but are not now used (assuming the reliability of investigations) for lack of proper training. In a word, liberal educators call attention to the fact that the principle of social utility is a very conservative instrument, that it is in reality a new name for the old doctrine that education consists in the transmission of a social inheritance from one generation to the other. Regardless of the name,

[2] In a survey of security ownership Dun's has reported that 346 corporations have had at one time as many as 5,847,651 common stock holders.

it is urged that the principle tends too exclusively toward the preservation of the *status quo* toward worship of the past, and not sufficiently toward improvement upon the past. The critics look forward to a school that will do more than merely follow in the wake of society; they favor a school that will be instrumental in advancing the welfare of society.

Value of the social-utility principle.—The foregoing argumet does not mean that the results of social-usage studies should be ignored. They should still be used in many respects as a guide in the selection of material when there is no reasonable doubt in regard to their reliability. It is well to note that these studies have made a positive as well as a negative contribution to curriculum making. On the positive side they have great suggestive value for the selection of the topics to be emphasized, the size of numbers and kinds of examples to be used, and the types of situations in connection with which the necessary calculation may most profitably be performed. Even here, however, caution is necessary, since a practice found to be most frequently used in social life may be found by experiment to be less effective than a practice less frequently used, in which case the latter has ordinarily a better claim for inclusion in the curriculum.

On the negative side the principle under consideration has probably made its greatest contribution. It has led schools away from things they have done that they ought not to have done. It has brought about the elimination of dozens of topics, on the ground that the social demand for them is not sufficiently general to warrant their retention. Thus is explained the disappearance of true discount, foreign exchange, partnership, troy weight, apothecary weight, compound proportion, surveyor's long measure, surveyor's square measure, government land measure, progressions, cord measure, customs and duties, shingling, longitude and time, and other topics from many forward-looking courses of study. The reader should note, however, that a satisfactory course of study cannot be constructed by the method of elimination alone, for this would imply the untenable assumption that what remained would constitute a reliable and an adequate body of content.

WIDE READING FOR BEGINNERS

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Extensive reading at the pre-primer period is so essential to the development of good readers and printed materials of suitable difficulty are so scarce that both teacher and pupils welcome new material which can be easily read. Some pre-primers are entirely within the comprehension of the children, their style attains a reasonable degree of literary excellence, and their vocabularies are carefully controlled. Therefore, they should be of great value as a source of material for wide reading.

Unfortunately, both the experience of teachers and the results of investigations bear witness to the fact that the overlapping of the vocabularies of any two pre-primers is so small that the whole of a second pre-primer is of greater difficulty than the same number of pages in the primer of the basal series.[1] That is, after a child has learned the 65 words in one pre-primer, he may find 40 new words in another pre-primer, whereas in the first 40 pages of the primer, he will meet only 20. Nevertheless, we can demonstrate that wide reading in pre-primers is entirely practicable under certain conditions. This has been shown by an exhaustive study of pre-primer vocabularies.

The vocabulary of any book is a list of words which appears in any, but not necessarily all, of its parts. Many words appear in the latter part of the book that do not appear in the front and words used in one unit are not used in a unit on another subject. It follows, then, that the vocabularies of individual units of a second pre-primer need not be as difficult with respect to any given text as is the vocabulary of the whole of the book which they comprise. Some units will follow a certain text much better than will other units. The amount of overlapping of the vocabulary of any basic text over the vocabularies of units of any second text will not remain constant from unit to unit, but it should at least be great enough for the child to read the new material with satisfaction. From these facts, it is logical to presume that it may be possible to select units from pre-primers which the children who have read one pre-primer will find easy to read because they will meet few new words per hundred running words.

On the other hand, a core of words which appear most frequently in a given list of pre-primers may be of greater functional importance for

[1] Stone, Clarence R. *Better Primary Reading*, pp. 44-138.

the reading of units of those pre-primers than may be the vocabulary of any single text. It may therefore be possible to build up a core vocabulary whose mastery will reduce the number of unknown words in selected pre-primer materials to the minimum desired.

To investigate these two possibilities, ten representative pre-primer reading programs were selected for consideration. Each was published between 1930 and 1936, and is, presumably, in quite general use among representative school systems. Furthermore, the topics included in these books covered the field of beginning reading. There were stories of children's experiences in both city and country, stories about the school, the circus, train rides, airplane rides, pets, shopping, games, and family life. The vocabularies of these ten programs include all words commonly used in beginning texts. Few new words were found after the vocabularies of the first seven books had been listed. Only proper names and a few common nouns were added.

Two of the programs regularly consist of two pre-primers each, and in these cases the words in both books were tabulated. The complete list of pre-primers follows:

Clara Belle Baker, Mary Maude Read, and Edna Dean Baker. *Playmates*, Indianapolis: The Bobbs-Merrill Company, 1934.

B. R. Buckingham and Marguerite P. Dolch. *Let's Play*, New York: Ginn and Company, 1934.

Katherine E. Dopp, May Pitts, and S. C. Garrison. *Little Friends*, New York: Rand McNally and Company, 1934.

Elson-Gray. *Elson Basic Readers-Pre-Primer* and *More Dick and Jane Stories*, Chicago: Scott, Foresman and Company, 1930 and 1934.

Leavell, Breckenridge, Browning, Follis. *Friends at Play*, New York: American Book Company, 1935.

Mabel O'Donnell and Alice Carey. *Rides and Slides* and *Here and There*, Evanston: Row Peterson and Company, 1936.

Mary E. Pennell and Alice M. Cusack. *Frolic and Do-Funny*, New York: Ginn and Company, 1932.

Nila Banton Smith. *Tom's Trip*, Chicago: Silver Burdett and Company, 1935.

Clarence R. Stone and Dodie Hooe. *Tom and Jip*, St. Louis: Webster Publishing Company, 1935.

Grace E. Storm. *Nip and Tuck*, New York: Lyons and Carnahan, 1936.

Each word, including proper nouns, was listed on the dictionary basis.

that is, the regularly inflected forms of a single root were combined. A total of 241 different words were used in the pre-primers studied. The frequency of use of each word was tabulated by pages.

The total number of repetitions of each word used in each pre-primer was determined from these tabulations. A grand total of 11,914 running words was so handled. In studying these tabulations, both possibilities for wide reading were considered together. First, we wished to see if there was sufficient overlapping between pre-primer vocabularies and parts of other pre-primers to permit wide and easy reading. Second, we wished to determine the possibility of setting up a core vocabulary which would be of greater value in wide reading than any basal vocabulary. The second alternative will be discussed first.

Of the 241 different words appearing in these texts, the 72 most frequently used were considered as a possible core vocabulary. The number 72 was chosen because it represents the average number of words found in the larger pre-primers, and therefore, seems to be accepted as a reasonable number of words upon which to concentrate at the pre-primer period. The first 72 words are presented in Table I and an additional list of 72 words which appeared less frequently is presented in Table II. The 97 words which appear least frequently and are not listed because they, collectively, make up a very small portion of the reading matter of the texts.

TABLE I

THE 72 WORDS MOST FREQUENTLY USED IN SELECTED PRE-PRIMERS

Word List	No. Repetitions	Word List	No. Repetitions	Word List	No. Repetitions
a	293	good	56	rabbit	55
Alice	160	have	82	ran	98
am	73	he	83	ride	108
and	243	here	169	run	163
baby	112	house	123	said	553
Ben	86	I	482	saw	66
Betty	46	in	131	say	55
big	61	is	359	see	147
bow-wow	47	it	121	she	64
can	122	Jane	118	something	50
cap	49	Jerry	64	Spot	55
cat	98	Jip	48	the	467
come	198	jump	72	this	74
Dick	92	like	108	to	328
did	45	little	189	Tom	100
dog	89	look	120	up	79
doll	45	may	44	want	155
down	67	me	108	we	56
father	172	mew	59	went	64
find	87	mother	203	what	76
for	94	my	74	where	63
funny	54	not	121	will	193
go	130	play	167	with	127
going	46	Polly	62	you	185
				Total	9,047

TABLE II

THE 72 WORDS LESS FREQUENTLY USED IN SELECTED PRE-PRIMERS

Word List	No. Repetitions	Word List	No. Repetitions	Word List	No. Repetitions
airplane	16	found	17	on	30
are	39	girl	17	one	36
at	29	good-bye	29	out	26
away	39	got	18	pig	17
ball	35	grandmother	41	pretty	23
bed	20	guess	41	puppy	37
black	18	help	19	red	32
blue	19	he	24	some	18
boat	17	home	31	stop	20
Bob	37	hop	21	store	39
boy	30	Jack	36	surprise	23
brown	18	Joe	36	they	30
cake	16	Judy	31	three	23
candy	22	kitten	29	too	41
car	21	laugh	25	train	38
catch	28	make	33	tree	27
coming	20	Mary	42	two	28
Dan	36	meow	18	walk	38
dinner	31	name	20	was	38
do	22	Nan	28	wee	26
Do-Funny	26	Nancy	26	white	30
draw	25	Nip	22	who	22
fast	34	no	41	yard	17
Fred	39	oh	44	yes	44
				Total	2,033

The relative importance of these three groups is indicated in Table III.

TABLE III

THE DISTRIBUTION BY GROUPS OF WORD USAGE IN THE 11,914 RUNNING WORDS CONTAINED IN 10 REPRESENTATIVE PRE-PRIMER PROGRAMS

Word Group	Total Usage	Percent of Total Running Words
First 72 Words	9,047	75.94
Second 72 Words	2,033	17.06
Remaining 97 Words	834	7.00

It may be noted from the data recorded above that the first 72 words are used more than three times as often as all other words combined, and that the 97 words least frequently used make up only 7 percent of the total number of running words. The first 72 words also have been shown to be of permanent value to the child. All of the adjectives, adverbs, conjunctions, prepositions, pronouns, and verbs are included in the list of 232 words which Dolch listed as a basic sight vocabulary.[2]

Only three of the common nouns are not included in Dolch's list but these have been shown by both Stone and Gross to be in common use in

[2] Dolch, Edward W. "A Basic Sight Vocabulary," *Elementary School Journal*, February, 1936.

children's readers and have, therefore, a high functional value at this stage of the reading program.[3] The eleven proper nouns happen to be more or less in style at this time. They will need to give the teacher little concern because children ordinarly have little difficulty in remembering the names of the characters in their stories. In view of these facts, it seems reasonable that the functional value of the words presented in Table I is great enough to warrant their being taken as a core vocabulary for pre-primer reading.

Each of the twelve pre-primers was divided into units on the basis of the subject matter presented. For instance, if the first six pages were principally about a dog, they were considered a unit. If the next twelve told of a trip to a circus, they were considered another unit, and so on. Sixty-four units were so secured and they appear in the left-hand column of Table IV. The vocabulary of each unit and the number of times each word was used in the unit was tabulated and compared with each of the ten first pre-primer word lists and with the core list in such a way as to determine the amount of overlapping per hundred running words of each unit.

This information is recorded in Table IV.

The data recorded in Table IV show that the maximum overlapping of textbook vocabularies over units is 100, the minimum is 15, and the median is 50 running words per hundred. The maximum overlapping of the core list is 100, the minimum is 46, and the median is 78 running words per hundred. The median overlapping of the core list exceeds the median of the textbook list by 28 running words per hundred. The comparative narrowness of the range of distribution of the number of overlapping words in the core list and the clustering of these scores about the median is easily seen from the data recorded in Table V.

Following the core list, more than twice as many units are available in which 80 percent or more of the running words will have been taught than following all pre-primer vocabularies combined. Proportionately, there are more than nineteen times as many units of this difficulty following the core list than following all other lists studied.

[3] Stone, Clarence R. *Better Primary Reading*, pp. 61-136.

Gross, Aline E. "A Pre-Primer Vocabulary Study," *Elementary School Journal*, September, 1934.

TABLE IV

THE AMOUNT OF OVERLAPPING PER HUNDRED RUNNING WORDS OF TEN BASIC PRE-PRIMER VOCABULARIES OVER SELECTED PRE-PRIMER UNITS

SELECTED UNITS		BASIC VOCABULARIES										
		CORE LIST	PLAYMATES	LET'S PLAY	LITTLE FRIENDS	ELSON BASIC PRE-PRIMER	FRIENDS AT PLAY	RIDES AND SLIDES	FROLIC AND FUN	TOM'S TRIP	TOM AND JIP	NIP AND TUCK
PLAYMATES,	pp. 4-13	68		58	62	63	62	41	48	54	34	27
	14-23	59		56	53	48	47	40	39	46	28	32
	24-33	69		77	73	60	73	58	56	54	33	40
	34-45	69		50	47	42	44	47	44	32	27	41
	46-55	78		59	69	70	58	61	53	40	40	58
LET'S PLAY,	pp. 1- 6	70	34		52	52	52	56	52	38	28	58
	7-12	80	58		62	66	73	65	67	46	27	52
	13-18	67	57		56	53	65	54	53	51	34	50
	19-31	74	39		57	58	58	59	65	50	26	37
	32-38	67	34		55	50	57	56	59	49	19	25
	39-45	70	40		51	60	61	57	69	51	29	43
LITTLE FRIENDS,	pp. 1-15	78	54	62		69	69	60	66	44	42	56
	16-20	77	51	70		72	62	69	59	50	40	45
	21-29	76	53	50		65	55	58	59	52	34	42
	30-38	74	37	50		55	47	63	49	48	43	52
ELSON BASIC PRE-PRIMER,	pp. 1- 6	100	55	37	60		50	56	45	24	64	56
	7-14	86	39	53	65		58	59	64	41	45	43
	15-23	90	53	43	62		56	57	64	41	33	57
	24-30	80	50	62	72		52	60	61	45	27	42
	31-35	86	41	56	64		52	60	60	45	34	41
	36-39	65	29	53	54		42	56	51	45	19	22
FRIENDS AT PLAY,	pp. 1- 6	100	57	69	62	68		58	59	58	36	41
	7-13	95	47	68	61	68		54	66	54	43	40
	14-22	84	49	70	59	69		52	66	48	37	38
	23-27	77	57	67	63	58		43	65	46	29	32
	28-34	88	60	68	65	67		58	71	56	34	41
	35-39	74	45	59	59	56		50	62	40	35	39
RIDES AND SLIDES,	pp. 2-16	87	33	64	66	52	55		58	52	56	46
	17-21	87	33	64	58	54	50		57	55	35	57
	22-28	83	50	45	56	66	62		39	47	28	55
	29-36	83	61	66	67	66	56		52	33	37	54
	37-41	80	28	50	55	68	44		42	40	29	50
	42-47	85	32	53	56	58	53		49	48	30	51

TABLE IV—*Continued*

SELECTED UNITS		CORE LIST	PLAYMATES	LET'S PLAY	LITTLE FRIENDS	ELSON BASIC PRE-PRIMER	FRIENDS AT PLAY	RIDES AND SLIDES	FROLIC AND DO-FUNNY	TOM'S TRIP	TOM AND JIP	NIP AND TUCK
		BASIC VOCABULARIES										
FROLIC AND DO-FUNNY,	pp. 1- 8	55	37	51	41	53	53	49		45	16	20
	9-15	75	50	67	62	55	71	38		50	34	40
	16-22	61	34	54	41	51	49	42		37	17	25
	23-31	67	30	70	44	70	67	49		61	30	45
	32-39	75	35	62	59	59	61	61		47	22	36
	40-48	66	38	56	47	59	61	45		42	30	37
TOM'S TRIP,	pp. 1- 4	75	35	40	55	60	40	70	60		50	55
	5-13	65	35	46	49	56	46	53	42		45	43
	14-28	59	35	50	46	49	47	52	48		39	36
	29-33	68	37	50	54	46	41	48	60		33	37
TOM AND JIP,	pp. 2- 9	97	29	46	35	74	59	44	59	42		49
	10-17	93	41	50	40	71	59	57	65	42		65
	18-29	79	38	34	47	43	39	47	40	47		63
	30-35	88	29	48	48	26	44	58	51	68		41
	36-40	79	42	52	54	58	53	62	56	71		65
NIP AND TUCK,	pp. 1-12	46	39	40	44	36	43	29	43	24	40	
	13-20	64	37	34	45	49	42	53	49	26	46	
	21-30	52	31	24	37	31	33	40	39	15	43	
	31-45	70	41	52	51	52	50	51	58	43	55	
MORE DICK AND JANE STORIES,	pp. 1- 8	85	41	51	53	97	49	53	61	37	32	38
	9-14	85	66	39	51	92	48	52	55	39	21	41
	15-23	68	50	43	57	95	49	46	47	36	29	34
	24-27	85	51	62	67	96	58	51	67	44	19	28
	28-37	90	41	56	64	87	49	57	52	47	51	46
	38-47	74	35	50	61	85	57	52	50	44	34	34
HERE AND THERE,	pp. 2- 6	73	36	56	59	71	55	82	64	59	40	58
	7-17	80	32	47	47	53	47	83	64	38	22	39
	18-25	86	38	54	58	53	55	96	50	54	48	40
	26-33	82	28	55	52	65	49	100	49	41	17	42
	34-38	82	41	50	53	57	50	93	48	56	31	39
	39-47	81	39	61	65	58	55	93	56	54	46	48

TABLE V

DISTRIBUTION OF NUMBERS OF OVERLAPPING WORDS IN THE CORE LIST AND IN TEXTBOOK LISTS PER HUNDRED RUNNING WORDS OF SELECTED PRE-PRIMER UNITS

No. Overlapping Words Per Hundred Running Words	No. Scores in Core List	No. Scores in All Pre-Primer Lists
90-100	5	8
80- 89	20	4
70- 79	19	16
60- 69	15	87
50- 59	4	196
40- 49	1	149
30- 39	—	88
20- 29	—	32
10- 19	—	8
0- 9	—	—

CONCLUSION

The data presented seem to warrant these conclusions:

1. A wide variation in the difficulty of the selected pre-primer units does exist. In many, if not most cases, units taken from the same book vary in difficulty when compared with each word list by an amount that is probably significant to the pre-primer child.

2. The core vocabulary is far superior to any text vocabulary for the reading of books or units from any other series.

3. If early, extensive pre-primer reading is desired, instruction leading to word recognition should be given in the light of the functional value of the words taught. Every word is not of equal worth for wide pre-primer reading.

4. Systematic work on a core vocabulary and careful selection of units to be read will make wide reading entirely practicable for beginners.

AN EXPERIMENT IN READING READINESS

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THE CONCEPT OF READING READINESS

UNTIL quite recently promotion to the first grade was determined through more or less subjective data. Did the child appear bright and interested? Was he proficient at construction and at cutting and coloring? Did he play well with the group? Did there seem to be enough maturity to warrant placing him in a more conventionalized situation in which he would have to remain quiet for longer periods of time? These were some of the questions which the kindergarten teacher asked herself when it came time to make up the promotion list of those who were to go to the first grade.

Of late investigators have been concerned with the development of more objective measures of a child's ability to do satisfactory first grade work. Since success in this grade depends almost entirely upon one's success in reading, it seemed that if measures of reading readiness could be devised that the promotion problem would be solved. Along this line, it was found by Reed[1] that satisfactory attainment in reading is the measure used in determining most first and second grade promotions. In a California study by Percival[2], it was found that there were more failures in reading than in anything else. Apparently if we can predict reading success, we can forecast attainment in the first grade at least.

THE FACTOR OF INTELLIGENCE

Gray[3] found that intelligence is a major factor in determining progress in reading but that there are other factors which must be taken into consideration. Deputy says[4] "The study also shows that, of the factors considered, intelligence is the most significant in determining a child's success in first-grade reading. But when the four individual tests were com-

[1] Reed, Mary M. *An Investigation of Practices in First Grade Admission and Promotion.* Contributions to Education, No. 290. Bureau of Publications, Teachers College, Columbia University, 1927.

[2] Percival, W. P. *A Study of the Causes and Subjects of School Failure.* Berkeley, California: University of California Printing Office, 1926.

[3] Gray, W. S. *Summary of Investigations Relating to Reading.* University of Chicago Supplementary Educational Monographs, No. 28, 1925, p. 51.

[4] Deputy, Erby Chester. *Predicting First-Grade Reading Achievements.* Teachers College Contributions to Education, Bureau of Publications, Columbia University, 1930, p. 45.

bined with the mental test, the predictive power of the combination was greater than that of the mental test alone."

Native intelligence is something which holds fairly constant throughout life. Lincoln[5] found the variation in I.Q. at various times to be in general not more than five points. Gray and Marsden[6] came to the same conclusion. Since we cannot greatly change native intelligence, it follows that we must do the best that we can with the material on hand. Certain children are with us in school, whether we wish these particular ones or not, and we must do the best that we can with them. It is with factors in relation to reading readiness, other than native intelligence, therefore that the writer is concerned.

OTHER FACTORS RELATING TO READING READINESS

Speaking of the discrepancies between scores on mental tests and achievement in reading, Oglesby[7] suggests that some of the factors which account for this difference are: health, attendance, nationality of the pupils, attitude toward school work, ability of teacher, quality of materials used in teaching, and method of instruction. Deputy concludes[8] "There is a group of factors, such as interest in stories, pictures, things, people, and surrounding life, the number of stories read or known, the extent to which conversation is carried on with others—that is, the child's proneness to things verbal in general—which, no doubt, are significant in a study of reading readiness, but thorough and objective study of all these factors would constitute an investigation in itself."

Ladd[9] found that there was no measurable relation between reading ability and sociological factors except that children from homes where foreign language was spoken were under a handicap. Other investigators have traced lack of ability to read to eye movements and other physical factors, to emotions and to many other causes. What the writer is concerned with is if it is possible to measure these factors

[5] Lincoln, E. A. "The Reliability of the Stanford-Binet Scale and the Constancy of Intelligence Quotients," *Journal of Educational Psychology*, XVIII (1927), pp. 621-626.

[6] Gray, P. L., and Marsden, R. E. "The Constancy of the Intelligence Quotient-Final Results," *British Journal of Psychology*, XVII (1926-27), pp. 20-26.

[7] Oglesby, Eliza F. "A Study of Achievements in Reading of X, Y, and Z Groups," *Detroit Journal of Education* (April, 1922), pp. 57-63.

[8] Deputy, Erby Chester. *Op. cit.*, p. 44.

[9] Ladd, Margaret. *The Relation of Social, Economic and Personal Characteristics to Reading Ability*. Teachers College Contributions to Education, No. 582, New York: Bureau of Publications, Columbia University.

other than intelligence and so predict when the child is ready to start to learn to read.

THE PREDICTIVE VALUE OF SOME READING READINESS TESTS

Using five tests largely of his own devising, along with the Pintner-Cunningham Primary Mental Test, Deputy concluded that[10] "The correlations found between the five tests of Reading Readiness and the combined scores on the tests of reading ability show that the Pintner-Cunningham Mental Test gives the best single means of predicting first-grade reading achievement. However, the other tests used in this study raised the predictive power of the mental test appreciably. The combined scores on the individual tests of reading readiness correlate with reading achievement practically as well as the scores on the standardizing mental test."

Lee, Clark and Lee[11] were able to obtain correlations of .49 and .54 between the Lee-Clark Reading Readiness Test and the Lee-Clark Primer Test and the Gates Test respectively, the latter two being given at the end of the semester while the reading readiness test was given when the children started the first grade.

These investigations made the writer desire to make further studies, using certain other reading readiness tests which are on the market. As a practical end, he wished to secure valid measures to use as a basis of promotion from the Lake Orion Kindergarten.

THE TESTING PROBLEM

To answer the questions raised in the preceding paragraph, the following testing procedure was adopted:

TABLE I

CHART OF TESTS USED IN LAKE ORION AND OXFORD KINDERGARTEN

Test	Lake Orion		Oxford	
	Given	Month Given	Given	Month Given
Metropolitan Reading Readiness	x	November	x	November
Van Wagenen Readiness	x	December	*	
Rhode Island Intelligence	x	January	x	January
Activity Naming**	x	February	x	February
Detroit Word Recognition	x	April	†	

* Lack of time prevented giving of this test.

† Reading is not started in Oxford Kindergarten until the first grade so there was no use of giving this test there.

** The Activity Naming Test is a new Reading Readiness test by Clifford Woody. It has not yet been placed on the market.

[10] Deputy, Erby C. *Op. cit.*, p. 44.

[11] Lee, J. Murray, Clark, Willis W., and Lee, Dorris May. "Measuring Reading Readiness," *Elementary School Journal*, XLIV (May, 1934), pp. 650-666.

In the Lake Orion Kindergarten, reading is started immediately after the Christmas vacation. This is of a very simple type, consisting of instruction from charts without the use of formal textbooks. While it was realized that twelve weeks of instruction could not accomplish so very much, it was felt that some slight measure of the predictability of the readiness tests might be accomplished. For this reason, the Detroit Word Recognition Test was given to see if anything could be found out in respect to predictive value. The results are summarized on the following pages.

EFFECT OF SEX

Table II shows the mean scores made by boys and girls on the various tests.

TABLE II

COMPARISON OF MEAN SCORES MADE ON THE FIVE TESTS BY BOYS AND GIRLS IN THE LAKE ORION AND OXFORD KINDERGARTEN

Test	Boys	Girls	Both
Rhode Island	18.4	19.8	19.1
Metropolitan	57.9	66.8	62.2
Activity Naming	65.4	69.0	67.2
Van Wagenen	27.3	34.2	30.5
Detroit Word Recognition	6.9	10.4	8.6

SUMMARY OF SIX DIFFERENCES

1. Girls ranked somewhat higher than boys in intelligence as measured by the Rhode Island Intelligence Test.

2. On the reading readiness tests, girls made consistently higher scores than boys. This is probably due to higher native intelligence or possibly somewhat to greater facility with language skills. Girls learn to speak at an earlier age than boys and, apparently, hold this language advantage until physical maturity.

3. Girls did considerably better than boys on the Detroit Word Recognition Test. This would be expected from the results obtained by comparing the two sexes on the reading readiness tests and Rhode Island Intelligence Test and from one's general knowledge in respect to the language usage of the two.

4. It would seem to be feasible for boys to defer beginning the first grade until they are approximately six months older than the girls.

CORRELATIONS BETWEEN THE TESTS

In spite of some lack of agreement between certain of the tests and the Detroit Word Recognition test, in general there seems to be a rather close correlation between the various tests. Table III shows the relationships.

TABLE III

CORRELATIONS AMONG THE TESTS GIVEN

Test	Van Wagenen	Activity Naming	Rhode Island	Detroit Word Recognition
Metropolitan	19 cases .82*	40 cases .88	48 cases .69	19 cases .69*
Van Wagenen		17 cases .54*	19 cases .59*	19 cases .48*
Activity Naming			40 cases .44	17 cases .24*
Rhode Island				19 cases .56*

* Computed by the Rank Difference Method rather than the Product-Moment which was the method ordinarily used.

SUMMARY IN RESPECT TO RELATIONSHIPS AMONG TESTS

1. The reading readiness tests correlate surprisingly well among themselves. Apparently they all attempt to measure about the same thing.

2. Intelligence appears to be an important factor in reading-readiness—but not the only one.

3. The Van Wagenen and Metropolitan Tests correlate quite highly with the Detroit Word Recognition Test. Probably they may be used to predict first grade reading success with quite a high degree of accuracy.

4. The Activity Naming Test apparently needs to be revised and standardized.

5. One would feel that the use of an intelligence test and several readiness tests would give a high degree of validity to promotions from the kindergarten to the first grade.

A FIRST GRADE CHECK-UP

As a further check on the validity of the reading readiness tests, reading tests were given during February of the school year following

promotion to the first grade. No children were retained in the kindergarten in either school, policies existing at the time not favoring retention for a second year in this department. The correlations, therefore, included all those who took the tests the previous year, whether or not they had been judged capable of doing first grade work. Both Lake Orion and Oxford are communities with a large percentage of "floating" population. There were just nineteen pupils left at Lake Orion who had attended kindergarten there the previous year, and but twenty at Oxford. None of the pupils in either community, by the way, whom the tests the previous year had judged to be unfit for first grade reading, had moved away. All of them are included in the correlations and all made at least average scores on the reading tests.

The Detroit Word Recognition Test, Form B, was given to the Lake Orion children (they had Form A the previous year) while the Oxford children took the Haggerty Sigma one examination. The Oxford scores

TABLE IV

CORRELATIONS BETWEEN SCORES MADE BY LAKE ORION FIRST GRADERS ON DETROIT READING TEST AND SCORES MADE ON VARIOUS TESTS BY THE SAME PUPILS WHILE ENROLLED IN KINDERGARTEN THE PREVIOUS YEAR

Test given in Kindergarten	Correlations with Detroit Reading Test, Form B, given in first grade
Activity Naming	.46
Metropolitan	.63
Van Wagenen	.71
Detroit Reading, Form A	.48
Rhode Island	.53

Note: The rank-difference method of computing correlations was used in all cases because of the small number of children involved.

TABLE V

CORRELATIONS BETWEEN SCORES MADE BY OXFORD FIRST GRADERS ON HAGGERTY SIGMA ONE READING TEST AND SCORES MADE ON VARIOUS TESTS WHILE ENROLLED IN THE KINDERGARTEN THE PREVIOUS YEAR

Test given in Kindergarten	Correlations with Haggerty Reading Test, Sigma One, given in first grade
Activity Naming	.15
Metropolitan	.27
Rhode Island	.24

Note: The rank-difference method of computing was used in all cases.

were very low, explainable by a policy existing at that school of starting reading very gradually and deferring intensive instruction in this subject until the second semester of the first grade.

Table IV and V show the relationships.

As has been mentioned, the Oxford scores on the Haggerty Sigma one examination were very low. Apparently the children had not had enough reading instruction at the time that the test was given to make anywhere near adequate scores.

SUMMARY AND CONCLUSIONS

Girls had better scores than the boys in all the tests. The differences were especially great in the Metropolitan and Van Wagenen Tests. This is probably due to higher intelligence and to greater facility which girls possess in respect to language usage. Language and intelligence probably worked to give the girls much higher scores on the Detroit Word Recognition Test. The differences were surprisingly small on the Activity Naming Test. Since this is a test involving knowledge of the environment, it is likely that the language factor does not operate to such a full extent. Apparently boys should be promoted to first grade at a later age than girls.

The predictive value of the tests does not seem to be always reliable. Some cases who were among the poorest as measured by the Metropolitan and Van Wagenen Tests, ranked above others both times on the Detroit Word Recognition Test. It is apparent that the tests should be checked with other factors such as teacher's evaluation, general interest, etc. The Metropolitan Test furnishes fairly good norms for some age groups but needs to be better standardized, in the opinion of the writer. The Van Wagenen norms are even more unreliable, our evidence indicates. No standards have been worked out for the Activity Naming Test. No norms are given by the authors for the Detroit Word Recognition Test when used in the kindergarten. One would be safe in saying, apparently, that they should make a score of three which is the standard set up for the start of the first grade.

The reading readiness tests correlated well together. The Van Wagenen and Metropolitan ratio was .82, an exceptionally high figure. The Activity Naming correlated well with the Metropolitan but not so well with the Van Wagenen.

One judges, when he takes into account the comparatively low correlations between the Rhode Island Intelligence Test and the Reading

Readiness Tests, that there must be factors other than intelligence which enter into Reading Readiness. This factor (intelligence) may be the principal one, as is suggested by Deputy, but it cannot be the only one.

The Metropolitan and Van Wagenen Reading Readiness Tests on each occasion at Lake Orion had high correlations with the Detroit Word Recognition Test. The number of pupils given the tests, however, is too few for any final conclusion.

The Haggerty Sigma one scores at Oxford during 1936 were too low to be given any significance. The Activity Naming Test correlations were low on all occasions. It seems apparent that the Van Wagenen and Metropolitan Readiness Tests may be used individually to predict reading readiness with quite a high degree of reliability. Several tests used together, though would give a much better indication as to probable success in reading. In no case should the results be used without checking with other factors. Used in this way, there seems to be little question of the value of the use of the reading readiness test in predicting first grade reading success.

The Activity Naming Test has possibilities but needs to be refined and standardized.

SOME SUGGESTIONS CONCERNING THE RELATIONSHIP EXISTING BETWEEN SIZE OF HIGH SCHOOL ATTENDED AND SUCCESS IN COLLEGE

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THE conclusions of previous writers concerning the relationship between size of high school and success in college are not in perfect agreement. For example Remmers and Stalnaker wrote (11, 12)*, "The graduates of the larger high schools secure a higher average psychological test score, a higher average personnel rating, stay in school longer, come from the city to a greater extent, are distinguished students in larger proportion, are not put on probation as frequently, come from the lower division of their graduating class, and obtain a higher college grade although they secured a lower high school average."

Douglas, on the other hand, said (5,292), ". . . the data of this study agree with those recently reported by Odell relative to the relationship between college success and size of high school from which the student was graduated. The zero order coefficient of correlation between size of school from which graduated and college success was no greater than .04. An examination of the correlation scatter diagrams indicates that the schools of less than four teachers do not do quite so well as do those from the higher high schools, but the difference is small—less than .25 of a grade point—and the overlapping is great, almost as many outstanding students coming from the smaller schools as from the larger ones."

It is entirely possible that the relationship between size of high school class and academic success varies with the geographical area studied, but it appears, after a survey of available references, that the relationship may be quite uniform throughout the country and that the sundry results would agree if they were subjected to the same methods of measurement, the same types of analysis, and if their significance were interpreted in the light of a common purpose.

Equivalent measures should be used if results are to be compared. The two basic measures needed in this problem are measures of high school size and measures of success in college. Different classifications have been used in measuring high school size,—such as size of school dis-

* The first numeral in the parentheses indicates the title as listed in the bibliography at the end of the paper and the second numeral indicates the page.

trict, enrollment of high school, size of graduating class, and number of teachers. The number of divisions of the measure of high school size varies from two, small and large, to a larger number such as is indicated in Table II, but it does not appear that the use of different units in measuring high school size has contributed to any great extent to the confusion of results.

Different measures of college success have, on the other hand, led to considerable confusion. The statisticians working in this field have agreed, for their purposes, that college success should be measured solely by academic accomplishment, yet there is not complete agreement regarding the stage in the college course at which accomplishment should be measured. Different authors have made measurements at different times, and it appears to be in the nature of *this* problem that the results change as the measured group progresses through college.

The academic accomplishment is usually measured by the academic average as found by weighting with honor points. Sometimes the total honor points collected are used as the measure of success. It appears that these two measures are quite comparable for the purpose of the study of the present topic, although it is possible that the use of total honor points shows up the good student to better advantage than does the use of averages. However, an index of college success as determined by the first semester (or first quarter) freshman record is not to be compared with a record taken some years later unless careful examination is made of those who have withdrawn from college in the meantime.

If results are to be compared they should be subjected to common methods of analysis. A survey of the available literature has led to the suggestion that the conclusions previously drawn may depend more on the methods of analysis than they do on the information itself. Thus those who use the method of averages are apt to discover quite significant tendencies, while those who use the method of correlation are not so inclined to emphasize the significance of their results.

The Pearsonian correlation coefficient is an accepted summary measure of linear trend. Those who do not use this summary figure give a detailed analysis of the correlation table and frequently find certain group tendencies. These tendencies are presented by the use of percentages or by a listing of the means and standard deviations of the columns (or rows) of the correlation table. Undoubtedly a presentation which shows a definite trend in the correlation table is more valuable than the summarizing correlation coefficient alone, but it would appear sensible to

present in addition a Pearsonian coefficient in all cases in which the writer wishes to make definite statements about trend. The coefficient provides the reader with an objective measure of the extent to which such linear trend really exists, and enables him to form some estimate of the extent to which the results agree with those of others.

The significance of the results must be interpreted in terms of what one is trying to do. The main objective of course is to secure trends which will enable one to make individual predictions with accuracy. For this purpose the correlation coefficient must be very high. None of the correlations which have been obtained between size of high school class and success in college is large enough to be of significance in making individual predictions.

In lieu of the ability to make individual predictions we attempt to make group predictions. Thus it may be possible to predict the average grade (scholastic success) of all students from high schools of certain size without being able to predict the grade of any particular student. Such group information, while by no means as valuable as individual information, is preferable to no information at all. A small correlation coefficient may be useful in making such group predictions. The emphatic statements which some authors make regarding success in college and size of high school must be regarded in the group, rather than in the individual, sense.

A brief summary of some of the previous studies is here presented. Pittinger (10) studied the classes entering the University of Minnesota in 1910 and 1911. He classified the high schools according to hundreds enrolled and measured success in college by total points rather than by average. He separated the freshmen, sophomores, etc. in measuring academic success and presented his results by the use of medians and quartiles. He concluded, page 109, "... graduates of the larger high schools may be expected slightly to surpass the graduates of the smaller high high schools, when both reach college."

Thornberg (13) studied the classes entering the State College of Washington in 1921 and 1922. He used total honor points as a measure of academic success and presented his results in tables with the use of percentages. As a measure of academic success he combined the freshman record of the class of 1922 with the two-year record of the class of 1921. He reported, "... students from large schools are superior in scholarship in college to those coming from small high schools. In general scholarship increases with the size of high school. The most marked dif-

ference in quality of college work is found between students coming from high schools with an enrollment of more than 100 students. This does not seem due so much to difference in native ability as difference in preparatory training."

Gowan and Gooch (6) reported the situation at the University of Maine in 1926. They selected all graduates of the University who had entered during the years 1909-1917 and whose records were complete. They used the freshman average as indicating academic success, but it was applied only to those students who had graduated from college. They report, "The general trend of these results clearly points to the conclusion that the quality of the high school does not play more than an insignificant part in subsequent college work which the student does."

Ayres (1) in reporting on the engineering students of all classes at Iowa State College in 1927 wrote, "In high school class size, very large and very small institutions seem to prepare for college more thoroughly than do those of intermediate size." There appears to be no specific measure of scholastic achievement, but from the nature of the study one would assume that it was the cumulative average rather than the freshman average. The author qualified his conclusion with the statement that he had only a relatively small number of students from small schools available for study.

Lemon reported (8) a study of the lowest decile group (according to the Iowa qualifying examination) of the freshmen entering the University of Iowa in 1925. While not dealing directly with the relation of high school size and college success, it is interesting to note that about two-thirds of his clinical group came from small schools. He also quoted Benz (2) as saying that students from large city high schools do better.

Clark (4) described the situation at Northwestern University and indicated that the correlation between high school rank and college rank was equal to .70 when the size of the high school class was greater than 100. The correlation was not as good when graduates of high schools of smaller size were admitted.

Yates (14) quoted Jackson (7), who studied the freshman entering the University of Nebraska in 1925, as saying that he found little difference in the scholastic success of students from different types (according to accrediting agencies) of high schools. While not entirely pertinent to the problem under discussion it is evident that the groups of high schools studied were similar to the groups under consideration here. The study was also mentioned by Douglass (5).

Stalnaker and Remmers (12) reported the situation at Purdue University. They give a correlation coefficient of .144 ± .028 and a somewhat larger one of .21 ± .01 when the high schools are grouped into large and small. They state: "The size of high schools in Indiana is significantly related to elimination from Purdue University. . . . First semester grades show a slight, though significant relationship with size of high school."

Ruth Brown (3) reported the results of a study dealing with the freshmen entering twenty colleges and universities in Michigan in the fall of 1928. She measured size of graduating class and used class intervals 0-24, 25-49, ..., 200-224, 225-. First semester average was taken as a measure of academic success. She presented the results in tabular form and gave the means and standard deviations for each high school group. She concluded, "There is a general tendency for students from larger high schools to obtain somewhat better first semester grades, but this trend is not consistent between high schools of various sizes unless they are grouped roughly into three divisions: small, medium, and large."

In this study information about the size of the high school was missing in 62 percent of the cases, so it is barely possible that the approximately 2000 cases left did not give a fair picture of the situation in Michigan.

Grace Manson (9) used a similar technique in examining the freshmen entering the University of Michigan in 1926 and 1927. She presented correlation tables for first and for second semester grades for the students entering the Literary College, the College of Engineering, and the College of Architecture. She computed correlation coefficients which she gave as follows:

TABLE I

CORRELATIONS BETWEEN SIZE OF HIGH SCHOOL AND FRESHMAN GRADES FOR DIFFERENT UNDERGRADUATE COLLEGES OF THE UNIVERSITY OF MICHIGAN—1926, 1927

	Literary College		Engineering		Architecture	
	1926	1927	1926	1927	1926	1927
Size of high school and first semester grades	+.18	+.12	+.12	+.08	+.09	+.11
Size of high school and second semester grades	+.12	+.04	+.08	+.07	+.10	—.07

She said, in part, "Correlations of this size are to be expected after examining the tables giving the average university grades for high schools of each size. For although students from smaller schools do below av-

erage work, the rise of grades is neither regular nor consistent with rise in size of graduating class. In fact the tendency seems to be more in the direction of the best work from the medium sized school. . . . some students who do above average university work come from schools of all sizes."

Douglass (5,292) in a study which was quoted at the beginning of this article and which dealt with a five-term academic record of students of the University of Oregon of the class of 1930, suggested that his results are in agreement with those of other studies. Although he mentioned the authors and the institutions in which the studies were made, he did not give specific references. He reported indirectly "an unpublished study by Cornell and Condit in which coefficients of correlations between the size of school and college marks range from .002 to .117, the latter a biserial r, the two groups being small groups and large ones."

A study of the material in the above sources leads one to the following tentative hypotheses:

1. That there is quite universally a positive significant correlation between size of high school and first semester grades which is represented by a coefficient of less than .25.
2. That the size of this coefficient decreases with successive semesters so that by the end of two or three years its size is so small as to be insignificant.
3. That a larger percentage of the students from the small high schools than from other groups is eliminated in the first semester and in succeeding semesters.
4. That the students from small high schools who survive this elimination are at least the equals, and perhaps the superiors (in the academic sense), of the students from the larger high schools who have also survived.

In order to check these hypotheses there is presented an analysis of certain data which have been collected by the staff of the Office of Educational Investigations of the University of Michigan under the direction of C. S. Yoakum. The measures used in the Brown (3) and Manson (9) studies were applied to the freshman class entering all non-professional schools of the University of Michigan in 1928. Correlation coefficients were computed for each semester of the first three years. In Table II are given the number of students, the percentage of the original group, the correlation of size of high school graduating class with academic averages, and the probable error of this coefficient for those com-

pleting (1) the freshman first semester, (2) the freshman year, (3) the sophomore year, and (4) the junior year. The records of the senior year are not at present available.

TABLE II

THE CORRELATION COEFFICIENT BETWEEN ACADEMIC AVERAGE AND SIZE OF HIGH SCHOOL AT DIFFERENT STAGES IN THE UNIVERSITY COURSE, FOR THE STUDENTS ENTERING NON-PROFESSIONAL SCHOOLS OF THE UNIVERSITY OF MICHIGAN IN 1928 (WITH ALLIED INFORMATION)

		Students Completing			
	At Entrance	First Semester	Freshman Year	Sophomore Year	Junior Year
Number of Students	1222	1173	1051	846	708
Percentage of Original Group	100	96	86	69	58
r		.156	.089	.032	—.031
P.E.		±.019	±.021	±.023	±.025

An examination of Table II leads first to a conclusion as to the decreasing value of r and secondly to a question as to the high school class groups of those who have dropped out. Table III has been prepared in answer to this question and shows the percentage of each high school class group completing the college time units used in Table II.

TABLE III

THE ELIMINATION OF STUDENTS ACCORDING TO THE NUMBER OF STUDENTS IN THE GRADUATING CLASS IN HIGH SCHOOL

Number of Pupils in Class	Percent of Students Who Entered College and Were Still in Attendance at the Completion of:			
	First Semester	First Year	Second Year	Third Year
225-	97	90	70	61
200-224	93	89	71	63
175-199	100	90	68	58
150-174	98	93	79	71
125-149	97	87	72	62
100-124	98	81	77	63
75-99	97	87	66	55
50-74	98	92	75	59
25-49	93	82	66	54
0-24	91	73	57	44

On the basis of this evidence it appears that the probability of early withdrawal from college is greater in the case of graduates of the smaller schools. The question remains as to the relative scholastic attainments of the groups of students who survive. The correlation coefficient of —.031

given in Table II indicates that there is no appreciable difference in the attainments of the various groups completing the junior year. This can be made more evident by showing the averages for each group for the first freshman semester and for the junior year. This is done in Table IV.

TABLE IV

MEAN HONOR POINT RATIOS EARNED BY STUDENTS DURING THE FIRST SEMESTER AND DURING THE JUNIOR YEAR ACCORDING TO SIZE OF SCHOOL

Number in High School Class	First Semester Average	Junior Average
225-	2.38	2.53
200-224	2.55	2.64
175-199	2.28	2.44
150-174	2.32	2.62
125-149	2.17	2.49
100-124	2.14	2.59
75-99	2.12	2.52
50-74	2.29	2.59
25-49	2.12	2.55
0-24	2.01	2.64
Average	2.23	2.56

It is here apparent that the students from the smallest schools (0-24) have during the junior year as high an average as the students from any group in the list. The pattern of the junior year averages, checks to some extent with that given by Ayres (1) while the freshman year pattern agrees with that described by Ruth Brown (3) and Grace Manson (9).

The four tentative hypotheses seem to be true in this case. It is even possible that they are quite universally true and that Pearsonian coefficients, if they were computed, would quite generally follow the pattern described. At least this hypothesis tends to reconcile the apparently contradictory conclusions reported.

If the hypotheses are true, the measures used by Gowan and Gooch (6), Douglass (5), and Ayres (1) should give results which approach the junior average column of Table IV. They do. Also, the first semester column of Table IV seems to be a fair representation of results obtained elsewhere by using first semester measures.

SUMMARY

I. So far, no one has established the existence of a relationship between the academic success of students in college and the size of the high school class from which they were graduated which is definite enough to serve as the basis of individual prediction.

II. The contradictory studies of previous writers seem, in general, to agree with the hypothesis that there is, quite universally, a group relationship which is characterized by:

A. A positive correlation coefficient of high school size with first semester record of not more than .25 (in general, very small).

B. A correlation coefficient between high school size and scholastic record which decreases as the student progresses through college and becomes insignificant by the end of two or three years.

C. A larger percentage elimination of students from small schools than of students from large schools in the first and immediately following semesters.

D. The relative scholastic equivalence of all groups in the later college years.

No attempt is made, in this paper, to present explanations or causes. Thus the situation described in II C is not necessarily due to inadequate scholastic preparation in the high school. It might be true that the student from the small high school, as compared to his classmate from the city, has a much more difficult problem of social adjustment, that his intelligence is not as high, that he is not as well financed, etc. It is the purpose of this paper to extract from the conflicting reports of previous studies that information which seems to have been found quite universally true when college success is "predicted" from high school size alone.

With this factual situation established an assault on the problem of individual prediction is again indicated. A satisfactory solution of this problem is presumably not near at hand since many factors such as high school grade, native intelligence, age, class size, method of teaching, general environment, etc. must be considered. Many relations with these factors have been discovered and some of these are mentioned in the following bibliography.

In practical predictions of this kind the formal multiple and partial correlation technique is being displaced by the method of homogeneous grouping. This is the method which is recommended for future studies of this problem. The records of high schools which are homogeneous as to size should be combined and the means, standard deviations, and intercorrelations of other recorded variables compared.

In the work of the Office of Educational Investigations of the University of Michigan we have recently started to indicate the specific high school on the Hollerith card which records high school average, score on

A. C. E. examination, freshman record, etc. Results obtained from these cards in the next few years should supplement similar results obtained by other institutions, and take us a step nearer the desired goal of individual prediction.

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SOCIOLOGICAL FACTORS IN ABSENCE FROM SCHOOL

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THIS article relates to such factors as age, sex, sibling position, retardation, death of parent, and place of residence of children in relation to absence from the four upper grades (4-7) of white elementary schools in South Georgia. Data were supplied on questionnaires by teachers of the respective grades in nineteen schools. The data relate to approximately 3,000 different children; pertain to both county and city schools; and were collected when the school year was roughly half over.

Age, sex, and residence in relation to absence.—Data on this relationship appear in Table I.

The table shows a considerably larger percentage of absence among country children, both sexes, than among town children, particularly if country children attend a county rather than a city school. Ordinarily girls are absent less than boys, whether living in town or country, although sex differences are less for town than for country children. Among town children there seems to be no consistent relationship between pupil age and amount of absence. However in the case of country boys, those thirteen years old or over are consistently absent more than younger boys. A comparable situation among country girls is not so clear.

Distance from school buildings, and difficulty in getting to bus routes if transportation is provided, are perhaps factors affecting absence among country children. Non-school work seems a likely factor, even though the data relate to elementary-school pupils. The greater amount of absence among boys than girls may suggest that boys engage in gainful employment more than girls, particularly if the family lives in a town in a region in which colored domestic servants are commonly employed. Since servants are less common in country than in town homes, and since much of the agriculture of the region is modified hoeculture in which many or all members of the family engage as soon as large enough, non-school work is probably a greater cause of absence among country than among town girls.

It seems however conceivable that data which merely report absences without indicating cause of absence, might mean that country children, especially boys, have greater liberty to play hookey and to engage in

TABLE I

ABSENCE RECORD ACCORDING TO AGE, SEX AND RESIDENCE, AND ACCORDING TO TYPE OF SCHOOL ATTENDED

Age of Pupil and Type of School	Living in Town†								Living in Country							
	No. of Cases	Boys Percent of Time Absent			Girls Percent of Time Absent				No. of Cases	Boys Percent of Time Absent			Girls Percent of Time Absent			
		Under 2%	2–8.9%	9–19.9%	20% or over	Under 2%	2–8.9%	9–19.9%	20% or over		Under 2%	2–8.9%	9–19.9%	20% or over	Under 2%	2–8.9%	9–19.9%	20% or over
County Schools:																		
‡10 yrs. old or under	46	72*	24	3	2	38	76	18	3	3	50	46	28	18	8	63	60	27	11	2
11–12 yrs. old	76	80	16	3	1	57	82	16	2	0	49	31	41	14	14	72	46	36	13	5
13–14 yrs. old	28	68	10	7	15	28	82	14	4	0	55	14	24	33	29	53	55	19	13	13
15 yrs. old or over	12	76	8	8	8	4	75	25	0	0	21	24	24	33	19	13	31	31	23	15
City Schools:																				
10 yrs. old or under	236	59	30	10	1	216	69	25	6	0	71	51	29	13	7	94	61	31	7	1
11–12 yrs. old	241	64	25	8	3	278	67	26	6	1	101	49	23	18	10	97	53	31	10	6
13–14 yrs. old	95	60	28	9	3	94	76	19	3	2	66	29	27	24	20	54	55	20	15	10
15 yrs. old or over	19	48	47	5	0	18	79	11	5	5	23	22	22	43	13	10	40	40	10	10

† "Town" may mean a village of under 2,500 population.

* Thus 72% of the boys of this age and residence category were absent less than 2% of the time, 24% were absent 2–8.9% of the time, etc.

‡ These are schools located either in the open country or in communities of under 2,500 population—1930.

These connotations apply throughout the study.

TABLE II

ABSENCE RECORD ACCORDING TO DEATH OF FATHER, BY TYPE OF SCHOOL, PLACE OF RESIDENCE, AND SEX OF PUPIL

Type of School Attended and Death of Father	Town									Country								
	Boys					Girls				Boys					Girls			
	No. of Cases	Percent of Time Absent				No. of Cases	Percent of Time Absent			No. of Cases	Percent of Time Absent				No. of Cases	Percent of Time Absent		
		Under 2%	2–8.9%	9–19.9%	20% or over		Under 2%	2–8.9%	9–19.9% 20% or over		Under 2%	2–8.9%	9–19.9%	20% or over		Under 2%	2–8.9%	9–19.9% 20% or over
County Schools:																		
Father living	159	75	18	3	4	135	82	15	2 1	174	30	30	23	17	203	51	28	13 8
Father dead	12	58	42	0	0	26	73	12	12 3	14	65	0	14	21	21	43	14	14 29
City Schools:																		
Father living	584	60	28	10	2	660	66	28	5 1	262	42	26	20	12	251	55	29	11 5
Father dead	59	49	37	12	2	64	67	25	6 2	18	61	13	13	13	26	61	23	8 8

similar non-school activities than do other children. The history of education suggests that an agricultural society feels less the need of education than an industrial society, so among contemporaries country folk may feel its need less than persons living in town. It is sometimes thought that this attitude, along with other factors, is reflected in the shorter school term, lower-paid teacher, etc., typical of the country as contrasted with the town school. If a difference in educational consciousness between town and country people is reflected in the ways thus suggested, it might also be reflected in regularity of attendance.

Death of parents in relation to absence.—Data on this topic were tabulated by school grades, and for both parents. Because of the particularly small number of instances in which the mother was dead, and the resulting inadequacy of data for comparison with those living, these data are not presented. Furthermore only 8.9 percent of the children supplying data in this connection have fathers dead, which means that the number in some grade categories was too small for significant comparison. Hence only totals are reported. These appear in Table II.

Since the children here represented are in the upper elementary school, one would not expect the typical father to be particularly far along in years, and would hence expect most of them to be living. As far as conclusions are warranted by the data for the group whose fathers have died, no consistent difference appears in absence pattern among such children from that shown by children whose fathers are living. It is quite possible, however, that the situation in this regard would be different for children of high-school age.

Scholastic retardation in relation to absence.—Since relative comparison among groups is here intended, rather than comparison of these groups with an external absolute standard, it seemed legitimate to assume that children enter school at the age of six years, and that normal progress consists of completing one grade per year. Thus a fourth-grade child making normal progress is ten years old, a fifth grade child eleven years old, etc. Table III presents data on this topic.

It might be noted in passing that here, as usual, only a few pupils are accelerated. A larger percentage of boys than of girls are retarded, irrespective of residence or type of school attended. Moreover, boys are more often retarded two or more years than are girls. Sex difference in absences, suggested here as well as in Table I, seems hardly adequate to account for the sex difference in retardation, particularly among town children. Does a greater amount of non-school work done

TABLE III

ABSENCE RECORD IN RELATION TO RATE OF PROGRESS THROUGH SCHOOL, BY RESIDENCE AND SEX OF PUPIL

Rate of Progress by Type of School	Live in Town												Live in Country											
	Boys						Girls						Boys						Girls					
			Percent of Time Absent						Percent of Time Absent						Percent of Time Absent						Percent of Time Absent			
	No. of Cases	Pct. by rate of progress	Under 2%	2—8.9%	9—19.9%	20% or over	No. of Cases	Pct. by rate of progress	Under 2%	2—8.9%	9—19.9%	20% or over	No. of Cases	Pct. by rate of progress	Under 2%	2—8.9%	9—19.9%	20% or over	No. of Cases	Pct. by rate of progress	Under 2%	2—8.9%	9—19.9%	20% or over
County School:																								
Accelerated	2	1.2*	100	0	0	0	3	2.2	67	33	0	0	3	1.7	33	67	0	0	8	3.9	50	50	0	0
Normal Progress	76	46.7	86	12	1	1	73	53.7	79	17	3	1	46	26.3	50	28	17	5	55	27.1	55	38	7	0
Retarded 1 year	42	25.7	64	31	5	0	34	25.0	88	9	3	0	32	18.3	25	50	9	16	55	27.1	62	18	15	5
Retarded 2 or more years	43	26.4	65	14	7	14	26	19.1	81	19	0	0	94	53.7	20	22	32	26	85	41.9	42	26	17	15
City School:																								
Accelerated	16	3.0	94	6	0	0	28	5.1	82	14	4	0	6	2.2	50	50	0	0	16	6.3	50	50	0	0
Normal Progress	262	48.9	69	25	5	1	301	55.1	73	22	4	1	89	33.0	61	28	10	1	105	41.4	63	30	6	1
Retarded 1 year	130	24.2	65	26	7	2	119	21.8	63	30	7	0	54	20.0	39	30	22	9	59	23.2	66	17	15	2
Retarded 2 or more years	128	23.9	52	31	10	7	98	18.0	61	26	9	4	121	44.8	26	20	26	30	74	29.1	39	31	15	5

* Interpretation: 2 is 1.2% of the town boys who attended county schools; this percentage of this group were accelerated, 46.7% made normal progress, etc.

by boys leave less energy available for scholastic learning? Are boys less interested in such learning than girls, and hence less deserving of promotions made essentially on this basis? Are boys more mischievous and accordingly more likely to incur a teacher disfavor which is reflected in failure of promotion? Do women teachers, who decidedly predominate in the elementary school, find the ways of boys "naturally" annoying, and reflect this in promotions? Unfortunately the study includes no objective data on these items.

The table shows more retardation among country than among town children, irrespective of whether they attend city or county schools, and country children are more often retarded two or more years than are town children. Teacher-training, length of school term, etc., as probable factors in retardation are important, but will not be considered here. Reference has already been made to the possibility of less exacting competitions in country than in town life, with the associated lower value placed on education, as conceivably related to regularity of school attendance by country as compared with town children. The same thought might apply in regard to relative conscientiousness of attack by pupils on learning situations afforded by the school. It may also be noted that malaria and hookworm, still common in this region, occur more often among country than among town children. As a result, possibly country children have less energy for learning than do town children.

On the whole the table shows more absence among retarded children than among those making normal progress. The possibility of absence contributing to retardation is so generally accepted that it need not be considered here. A different possibility might, however, be noted. Perhaps those who are retarded are, for various reasons, less interested in school than are others, and stay out upon slight provocation. Studies in juvenile delinquency often support this suggestion.

Sibling position in relation to absence.—It is sometimes thought that the older children of large families are kept out of school to help care for younger children, thus presenting a cause of absence which would not appear in the case of younger children of the family. For this and other reasons it might be thought that sibling position within the family has a bearing on absence from school. In studying this possibility, only the children in grades six and seven were considered. The data appear in Table IV.

In general there seems to be slightly less absence in the case of children coming from families with one or no sibling older than the child

TABLE IV

ABSENCE RECORD ACCORDING TO SIBLING POSITION OF 6TH AND 7TH GRADE PUPILS, BY PLACE OF RESIDENCE AND BY SEX OF PUPIL

Sibling Position and Type of School	Town										Country									
	Boys					Girls					Boys					Girls				
		Percent of Time Absent					Percent of Time Absent					Percent of Time Absent					Percent of Time Absent			
	No. of Cases	Under 2%	2–8.9%	9–19.9%	20% or over	No. of Cases	Under 2%	2–8.9%	9–19.9%	20% or over	No. of Cases	Under 2%	2–8.9%	9–19.9%	20% or over	No. of Cases	Under 2%	2–8.9%	9–19.9%	20% or over
County Schools:																				
Two or more siblings older	37	78	16	3	3	27	78	22	0	0	35	20	34	37	9	47	49	32	17	2
None or one sibling older	49	80	10	4	6	34	80	14	6	0	40	28	32	22	18	32	56	38	6	0
None or one sibling younger	61	82	13	2	3	42	76	22	2	0	37	24	38	33	5	43	56	33	9	2
Two or more siblings younger	27	70	14	8	8	20	85	10	5	0	38	26	29	24	21	37	46	35	14	5
City Schools:																				
Two or more siblings older	90	65	32	2	2	146	77	18	4	1	51	39	22	33	6	57	51	28	19	2
None or one sibling older	154	74	20	6	0	146	78	18	4	0	65	55	28	14	3	44	66	25	7	2
None or one sibling younger	126	64	29	6	1	183	73	21	5	1	66	53	19	23	5	79	56	34	10	0
Two or more siblings younger	75	60	33	4	3	76	70	25	5	0	51	47	30	20	3	67	77	13	5	5

reporting, than in the case of children from families with two or more siblings older. The differences are not great, but they hold rather consistently for both town and country children. Likewise slightly less absence appears in the case of children coming from families with one or no siblings younger than the child reporting, than in the case of those from families with two or more siblings younger.

Thus it appears that more absence occurs in the larger families, whether the siblings are younger or older than the pupil reporting. This suggests that family size itself is a factor in absence from school. Possibly if one of two or three school children in a particular family happens to be ill, the others stay out of school too. This would obviously be true in the case of quarantine diseases. Moreover if transportation difficulties are involved, it might not seem worthwhile to put forth the effort to get one child to school when others in the family must stay out; if part of the children of the family can make up missed work, why not the others?

A further possibility is suggested. Social case studies indicate that delinquent youth are usually members of groups when they become delinquent. Each member is apparently an incentive for the others. If delinquency is a group phenomenon, the group factor may also be involved in the absence from school—when the group is within the same family, as when its members come from different families. Perhaps too only-children, or children of small families, are more strongly attracted by the playmate possibilities of school than are children of larger families who have playmates at home.

Conclusions.—Certain conclusions seem justified. Country children are absent more than town children. Among possible reasons are greater distance of country children from school building or bus route; more non-school work to do; the probability of all children of a family staying out when part of them do, if the home is not within walking distance of school; and lower social estimate placed on education among country people. The foregoing reasons, together with greater frequency of debilitating disease among country children; as well as such obvious factors as teacher training, length of school term, etc.; are probably reasons for greater retardation among country children.

Boys are ordinarily absent more than girls. Among suggested reasons are more non-school work among boys, as well as a greater variety of other non-school interests. These reasons, plus the possibility of more mischief and incurred teacher disfavor, were suggested as possible reasons for the greater scholastic retardation among boys than girls.

Sibling position seems unimportant in relation to absences, but children from large families seem to be absent more than other children. Among suggested reasons is the influence of disease, particularly quarantine disease, in large as compared with small families; the possibility of all pupils from one family staying out at times when transportation or similar difficulties make it necessary for some to be absent; and the possibility of absence, comparable to more serious delinquency, being a group phenomenon which could operate within large families, whereas children in small families might be attracted by play opportunities provided at school. It might however be suggested that country families, in the region studied, average larger than town families, and that country evaluation of education as reflected through children from large families is really more important than family size as such.

The data on this study, somewhat limited on the point, indicate no difference in absence pattern among children who have lost a parent as contrasted with those who have not.

EDITORIAL

RESEARCH IN THE USE OF MECHANICAL AIDS IN LEARNING

The ordinary academician accustomed to associating teaching with lectures, textbooks, and class discussion techniques may or may not be aware of the tremendous change now taking place in the basic instrumentalities of education. Prior to the invention of printing teaching was essentially an oral process between teacher and pupil. The invention of printing made textbooks more generally available and gave to education its present pattern of school buildings, libraries and teachers. Several very important new instruments of communication have arisen with the present century, used first for entertainment purposes and more recently for educational purposes, and now promise to change in significant respects even the basic patterns and practices of education. Whether the changes to be introduced will be as far reaching as those that accompanied the invention of printing remains yet to be seen. The particular reference here is to radio, silent and sound motion pictures, and sound recordings.

When one thinks of needed research in this field three sorts of questions suggest themselves: First, what are the educational needs of school boys and girls that these new instrumentalities might serve? These needs should probably include those now served by the school to which these instrumentalities might contribute and those to which the schools' present program does not administer. There is no reason why these new instrumentalities should be considered merely as supplementary means of instruction; they may in a reorganized program of instruction become primary. Second, how effective are these instrumentalities when employed for different purposes and under the varying conditions of classroom instruction? There are many purposes for which these new instrumentalities may be employed and numerous conditions practical and theoretical limiting their effective use in the classroom. The possible values to be derived from the use of these instrumentalities need systematic investigation. And, third, how can these instrumentalities be most effectively used in conjunction with those already available?

There are all in all three basic approaches to learning employed in education to-day, namely, a) learning by doing, b) learning by observa-

tion, and c) learning by verbal communication. Oral discussions between teachers and pupils and textbooks supply our present chief means of verbal communication. There is a widespread movement now on in education to introduce more direct contact learning and activities into the school curriculum. The radio, the silent and sound motion picture, and sound recordings while contributing to both verbal and observational learning may offer a new means, too, of bringing the world to the classroom for observational purposes. The problem here referred to is probably not basicly one of relative values, that is, of the general worth of one of these instrumentalities as compared with others, but one of determining the conditions under which each may be used most effectively and the purposes that it may best serve. Seldom will the teacher rely upon a single instrumentality: she will probably use combinations of instrumentalities. All of these problems need to be explored experimentally.

Besides the questions of a more general sort raised above there are many more detailed questions of importance that need investigation: To what extent do individuals differ in their susceptibility to visual, auditory, and tactual stimuli? To what extent do individuals differ in their susceptibility to observational (hearing, seeing, smelling, etc.), verbal and direct contact approaches to learning? To what extent may the effectiveness of these approaches to learning depend upon the pupil's intelligence, previous experience, and maturity? Turning to the production problems in the areas of radio, silent and sound motion pictures, and sound recordings: What are our general needs? What types of presentations promise to be most useful for school purposes? Where verbal means of communication are employed as in radio what forms of speech should be employed: straight talk, dramatizations, interviews, or what not? To what extent may these new instrumentalities be employed to supply curricular content? To what extent may they be employed to stimulate other activities to be carried out in school and home? In the school uses of these new instrumentalities: What is the teacher's place in the new education? To what extent may learning experiences be mapped out ahead of time, as in course of study making, and to what extent must they be planned on the spot? Are there any preferred sequences of experiences considered from the point of view of the instrumentalities involved? How may the teacher best assist the child in the integration of this potential wealth of school experience? There are many other questions. Very few people seem to realize to any considerable extent the educational potentialities of these new instrumentalities. The salesmanship program is already well under way; the plea here is for needed research. A. S. BARR

REVIEWS

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TRENDS IN DIAGNOSTIC AND REMEDIAL READING AS SHOWN BY RECENT PUBLICATIONS IN THIS FIELD

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THE first serious consideration of reading disability was by medical men at the turn of the century. For about 20 years the progress in diagnosis and remedial programs was slow. Only gradually was this work taken over by psychologists and educationalists. Since 1920, however, research and clinical practice in the field have been expanding rapidly.

It has come to be generally recognized that deficiency in reading is a marked educational handicap. In the past remedial work was pretty much confined to the elementary school level. More recently, however, programs for correction of reading deficiency have been extended to the high school and university levels in many instances.

Several methods and sources of materials for diagnostic and remedial work are now available. The ordinary clinician and teacher interested in the field, however, do not have available a list of the publications which give fundamental information on the subject and explain the levels at which the methods may be applied. The purpose of this paper is to give short notice of certain experimental sources and to describe briefly the more comprehensive methods and materials for remedial reading that are available. The discussion is not meant to be a comprehensive survey of the literature. Since the paper is designed to be a practical help to the clinician and the teacher, only those publications which can be obtained in the form of separate pamphlets, monographs, or books will be listed. Ordinary journal articles and books which contain a single pertinent chapter will not be included. Most space will be devoted to the more recent publications.

A good general background in the field of reading deficiencies may be obtained from various research and discussion monographs. Two yearbooks of the National Society for the Study of Education will be found valuable. In the first (50) are several reports on fundamental aspects of the reading process by recognized authorities. The second (47), similarly done, describes the marked progress achieved in 12 years. Both include important sections on reading deficiencies. A special number of the *Elementary English Review* (42) contains several articles by well known workers in the field. This number may be purchased separately. Bond (5), Fendrick (11) and Selzer (41) have investigated the relation of physiological deficiencies to reading disability. Gray (16) reports the results from diagnosis and treatment of remedial cases in reading. Although not a manual, this treatise describes procedures that are effective. In a later study Gray (17)

describes methods of improving reading instruction of elementary school pupils in rural, village and county schools: (1) Effective ways and means of reorganizing and improving the teaching of reading in harmony with the results of scientific investigations are outlined. (2) The character of the chief difficulties met in efforts to reorganize and improve reading were determined and methods by which many of the difficulties were eliminated are given. (3) The effect on reading achievement of these constructive changes in teaching was shown to be considerable. Gates and Bennett (14) describe an extensive study of reversal tendencies in reading. Previous work is criticized, new experimental findings presented, and remedial suggestions offered. The authors tend to favor an "acquired habit" theory rather than a "brain organization" theory to explain the reversals.

An intensive study of the reading habits and personality traits of 15 children who encountered difficulty in learning to read is reported by Hincks (23). It was demonstrated that emotional maladjustment may be caused by reading disability. The emotional disturbance frequently disappears when this deficiency is corrected. Dearborn (29) gives an excellent analysis of factors underlying severe reading disability. An experimental study of methods for diagnosis and treatment of disabled readers is reported by Monroe (32).

In the report of a program organized in a large elementary school system, Monroe and Backus (35) outline the general principles of diagnostic and remedial reading. The book is not a manual of directions, but is concerned with the principles and programs approved by the authors and the highly satisfactory results obtained by their application. The keynote of the remedial work was emphasis upon the individual.

Orton (36), whose background is in medicine, interprets reading disability in physiological terms. The book is stimulating although one may reserve judgment concerning the theories proposed. The analysis of reading behavior and the remedial treatment advised is sound. Points of strong emphasis are phonetics and kinaesthetic training.

Teachers will find Taylor's volume (46) useful. It contains comprehensive bibliographies of leaders in reading research, a complete historical sketch of techniques for study of eye movements in reading, and description of a triple-shutter tachistoscope designed to condition rhythmical left-to-right eye movements and accurate return sweeps while such moves are coördinated with the interpretative processes of reading. The last section describes the author's experimental results on remedial reading. Although satisfactory gains were achieved, all will not agree with some of the interpretations given.

Eurich (10) has studied the reading abilities of college students. He describes new measuring devices and reports the results of drills in reading, vocabulary and study.

Before considering the separate manuals it is well to consider two points of over-emphasis in remedial reading. These are physiological handicaps and eye-movement rhythm. It is obvious that children with poor hearing or marked visual deficiencies are going to have difficulty in learning to read. Such cases, however, are relatively infrequent. During recent years, certain writers have emphasized strongly the importance of various eye deficiencies as causal factors in reading disability. Eames, Selzer, Betts, and Wagner (all cited by 45) present evidence which seems to indicate an inti-

mate relationship between deficiencies in visual acuity, accommodation, and muscle balance and reading disability. Another group of investigators (cited by Stromberg, 45), such as Blake and Dearborn, Farris, and Fendrick deny that muscular deficiency is related to reading disability but admit that errors of refraction are probably causal factors. All of these findings are discredited by the results of Swanson and Tiffin, Witty and Kopel (cited in 45), and Stromberg who find little relationship between eye deficiencies and reading performance. Many workers in the field are now coming to believe that physiological deficiency as a cause of reading disability has been much overemphasized. It would seem that sensory deficiencies are probably relatively unimportant in comparison with more generalized habits and other central processes of perception and assimilation. This does not mean, of course, that visual defects should not be corrected whenever discovered. It merely suggests that emphasis should not be diverted from central processes to peripheral factors which appear relatively unrelated to reading status.

Since the early work on eye movements in reading there have been several writers who have placed some degree of emphasis upon poor eye-movement habits as determinants of reading ability. Among these are Pressey (37), Robinson (40), Cole (8), Gates (13), Gates and Bennett (14), Monroe and Backus (35) and a bulletin issued by the American Optical Company (38). These views have led to the assumption that training eye movements will improve reading efficiency. In fact, some of these writers and others who have accepted their views advocate the "pacing" of eye movements to improve reading efficiency. Robinson states "that such training improved eye-movement habits, which in turn increased reading efficiency."

There is ample evidence to show that eye-movement patterns (frequency, regularity, and duration of the fixation pauses) are external manifestations of perception and assimilation during reading. Hence they reflect reading status rather than determine proficiency of reading. The term "rhythm reading" and the implication that rhythmic eye movements produce efficient reading are unfortunate because they are misleading. There is no evidence that "pacing" eye movements as such develops effective oculo-motor habits which in turn improve reading ability as is assumed in the concept of "rhythm reading." In diagnostic and remedial work the clinician should emphasize the central factors of perception and assimilation rather than behavior of the eyes. When improvement is made here, the eye-movement patterns will readily adapt themselves to the changed status.

The concept of reading readiness cannot be neglected by the remedial teacher. There are now ample data which indicate that all six year old children are not ready for reading instruction. Children should begin reading only when adequately matured. A study reported by Wright (52) shows that reading progress in the first grade can be predicted with a fair degree of success ($r = .74$ between reading readiness and achievement) by selected combined measures such as data from a pupil rating scale, the Metropolitan Readiness test and mental age. This pamphlet also contains a useful annotated bibliography of relevant studies. A further investigation of reading readiness in relation to first grade achievement has been reported by Deputy (9).

A systematic treatise on reading readiness is presented by Harrison (19). This book analyzes factors influencing

reading readiness, outlines instruction for fostering reading readiness and presents an analysis of the available tests for measuring it. Suggestions for placement and a remedial program are also given. Proper weight is placed upon M.A. as a factor in reading readiness. The section on instruction fostering reading readiness is especially good. A more critical evaluation of results and fuller discussion of measurement would improve the book. Although desirable progress in measuring reading readiness has been made, more satisfactory measuring instruments and more adequate methods of procedure are necessary before the program can be generally effective.

There are several systematic works on methods for preventing and improving reading deficiencies. One of the most thorough of these manuals is that of Gates (13). The author's program for diagnosing reading disabilities and for remedial treatment is based upon the fundamentally sound theory that reading is not a single general ability but consists of a number of reading skills which are somewhat independent of each other. The problem is to discover which skills are deficient and to provide proper remedial treatment. This manual is to be recommended for its comprehensiveness, sound adherence to fundamentals and thoroughness of analysis. There is, however, an unfortunate emphasis upon eye movements as causal factors and upon the use of certain perception tests which add nothing of value to the diagnosis. The manual concerns itself with non-readers as well as with retarded readers.

Monroe's text (34) may be considered both a manual and a report of results. It consists essentially of methods of quantitative and qualitative measurement of reading ability, a discussion of causative factors, and results of remedial treatment. In general, the author has coördinated certain satisfactory techniques from other sources and added some new ones. The report of results indicates that the remedial treatment is highly successful. In summing up the author states, "The rate of progress in reading under remedial instruction was found to be a function of the child's intelligence, his age, the number of hours spent in training, the number of months during which treatment was continued, the severity of the disability, the personality and behavior difficulties encountered in applying the remedial training and the closeness of supervision of the remedial techniques." The critical user of Monroe's techniques will question the use of arithmetical ability to determine the reading index, and certain of the interpretations concerning causative factors in reading defects.

In his manual, Betts (4) presents a critical summary and interpretation of research findings with a well-organized program of prevention and correction of reading disability. There is a constant and heavy emphasis upon reading readiness as the soundest preventive measure. Included is an able evaluation of hereditary factors, handedness, eyedness, eye-movement habits and physiological status as factors in reading disability. The role of eye movements is appraised in a satisfactory manner. It is pointed out that the more fundamental habits of perception are reflected in the eye-movement sequences. Some will consider that the program of diagnostic measurement is too dependent upon specialized equipment and that there is a slight overemphasis upon physiological factors as determinants of reading performance. Nevertheless, the manual is a worthy addition to the few adequate and comprehensive treatises on reading disabilities.

The large section on diagnostic and

remedial methods in Hildreth's (22) text is entirely satisfactory. The evaluation of techniques is critical and the suggestions on programs, materials, sources of information, and interpretation are adequate. Again we find a satisfactory interpretation of the role of eye movements in reading. "Eye movements are resultants of perceptual habits which are in turn dependent on comprehension patterns." There is an unfortunate departure from this viewpoint, however, when the author states that reversals of letter sequences in perceiving certain words are due to faulty eye movements, and suggests training the "eye sweep" to remedy the situation.

Stanger and Donohue (43) avowedly and consistently attack the problems of diagnostic and remedial reading at the primary school level in line with Orton's cerebral dominance theory. The methods are obviously restricted to non-readers. Major emphasis is placed upon prevention of disability. It is important to discover prior to or early in the course of reading instruction those cases which need special help if they are to make satisfactory progress in reading. The material is presented from the teacher's point of view. Tests suggested for diagnosis are simple, easily manipulated and readily interpreted. The teaching procedure consists basically of promoting adequate left to right progress in word perception. It may be characterized as a clever modernization of the A-B-C method (24) of teaching reading by a judicious use of phonetics and kinaesthesis. Auditory, kinaesthetic and visual reinforcement are emphasized. It is obvious from the report that the techniques produce satisfactory results.

The text by Gillingham and Stillman (15) is concerned mainly with severe reading disability and related deficiencies. The limitations of physiological defects of the eye and faulty eye movements as determinants of reading disability are recognized. The authors do not wish to define reading problems in a traditional manner. It is claimed that all their reading problems were not merely non-readers, but cases of selective *language* disability. They apparently accept wholeheartedly Orton's physiological or cerebral dominance hypothesis (36). Little is said about techniques of diagnosis. The remedial methods advocated lay heavy emphasis upon phonetic and kinaesthetic (tracing) training. Sections on remedial work in spelling, which is intimately associated with reading disability, and in penmanship are included. Although teachers will find the section on reading somewhat restricted as to views on causes of disability and as to methods of diagnosis, the remedial techniques apparently yield adequate improvement in reading performance.

A very successful method of remedial treatment for non-readers is described by Fernald (12). It is essentially a kinaesthetic method. The child traces the unfamiliar word with the finger while pronouncing it. It is then written and spoken simultaneously. Gradual advances are made to sentences, new words in a story and to silent reading. The method has also been employed successfully with cases of partial disability in both children and adults, and in the learning of foreign languages.

The next three books were written for the schoolroom teacher rather than for the clinician. Stone (44) advocates for the primary reading program a clear definition of objectives in terms of the more acceptable recent trends in experimentation, and observation based upon surveys and experience in classroom practice. The program should be well balanced with both vocabulary load and difficulty of materials carefully graded

as to adequacy and difficulty from level to level. Special stress is placed upon furnishing each pupil with tasks which will permit successful performance. Extensive analyses of the vocabulary load of readers are given. Included are generous examples of worksheets, exercises, book lists and citation of case studies. The author is skeptical of wholesale postponement of reading instruction until there is physiological and anatomical readiness since as yet there is no adequate knowledge concerning these conditions. Non-readers are not considered. The book would have been improved by a more generous citation of tests for specific reading deficiencies and by inclusion of norms for reading levels.

Many teachers will appreciate the highly practical book on improvement of reading written by Cole (8). The description of methods is complete and the exercises and directions for construction of materials are ample. Areas covered include status of reading, eyesight, speed of reading, vocabulary, comprehension, and special problems. Throughout special emphasis is placed upon remedial treatment. Although aimed primarily at the improvement of reading in the elementary school, some of the techniques are satisfactory for the higher levels. There is a general tendency to overemphasize the mechanical aspects of reading, especially the part played by eye movements. This is also true with regard to the relation of physical defects to reading performance. Many will feel that more emphasis should be devoted to oral reading than advocated by the author.

Wilkinson and Brown's text (51) can also be characterized as highly practical and should be welcomed by the school-room teacher. It is designed primarily for improvement of reading in the intermediate grades and the junior high school. The directions throughout are written to the children. There are preliminary tests to measure needs and end tests to measure growth. Special sections are devoted to oral and to silent reading. Ample space is devoted to vocabulary training. Generous exercises are included so that the load on the teacher will be at a minimum. Space is devoted to several special types of reading situations. The materials are frequently organized in the form of interesting games. Some teachers may raise the question of overemphasis upon vocabulary training and drill in pronunciation which are not intrinsic to the reading situation. There is a marked contrast between this book and Cole's which places a minimum of emphasis upon oral reading.

It has been demonstrated by Hegge, Sears and Kirk (20) that reading disability cases exist among the feeble-minded. Remedial training produced marked improvement in reading which frequently resulted in better adjustment. Many illustrative cases are cited.

Baker and Leland's pamphlet (1) is principally concerned with symptoms, diagnosis, remedies and results for clinical cases of non-readers.

Just recently educators have come to realize the need for techniques to improve reading at the junior and senior high school levels. McCallister (30) presents methods of diagnosing and treating the deficiencies of retarded readers at these levels. In addition there are suggestions for guidance in problems that arise in reading content subjects. Throughout the book the major emphasis has been upon presenting the results of scientific studies and observations in such a manner that they may be applied to the school situation by teachers. Again we find an author who tends to overrate the value of eye movements as determinants of reading deficiencies. Furthermore, too little is made of the need for motivation. Although the techniques described will

not be considered entirely adequate to many teachers, the author is to be commended for making a good start in a relatively new field.

Few attempts have been made to present systematic methods for improving reading at the college level. Most texts on how to study, however, do have a chapter or section devoted to this level. There are two treatises that might be mentioned in this discussion. Pressey's manual (37) is concerned with practice exercises designed to promote rapid reading and to improve comprehension. Some space is devoted to the reading of graphs and figures. In Robinson's monograph (40) are reported the results of a study to improve reading disabilities of university students. Training to improve comprehension improved comprehension but not rate, and training for rate improved rate and to lesser degree improved comprehension. Both Pressey and Robinson have overemphasized the role of eye movements in reading disability. Too frequently the pacing of eye movements becomes a ritual that leads to misinterpretation. Furthermore, equivalent results may be obtained by other means. Nevertheless, many useful hints for remedial work at the university level may be obtained from these two publications.

Until recently, the teacher who wished to do remedial training in reading, especially at the high school and university level was seriously handicapped by lack of materials which she did not have time to select by herself. Now, however, there are available an imposing array of new materials. These, with a brief note on the principal characteristics of each, will be listed:

Bessey and Coffin (2) have selected materials from various sources to be used for improving comprehension and re-expressing the thought. These selections, followed by questions, are all relatively short and are taken from a variety of subject matter fields (history, algebra, etc.). They are designed essentially for work reading or reading for the purpose of using the content. The book may be employed at the junior and senior high school level.

"Reading for Skill" (6), also for junior and senior high schools, involves work-type reading. It consists of exercises designed to improve specific reading skills, including use of the dictionary and training for finding appropriate materials by use of various kinds of library facilities (card catalog, atlas, indexes, etc.). There are included both serious and humorous articles, stories and poetry. Diagnostic and check tests are furnished. The text is well organized.

Roberts and Rand's text (39) is designed for anyone able to read the selections but will find its greatest use at the junior and senior high school levels. The judiciously selected stories and articles are about the world as it is now and consequently of high interest value. Attention is given to the development of important reading techniques and to reading for various purposes. Devices to measure increase of speed and to test understanding accompany each selection. Progress is shown by an individual reading chart.

In Knight and Traxler's book (28), written for the junior and senior high school, the material is organized for use in a course in developmental reading, corrective instruction, for individual remedial work, or drill on special problems of reading. Training is varied to suit the purpose of the particular types of reading, such as scanning, grasping details, studying history, etc. Instructive sections on use of the dictionary and how to read the newspaper are included. Exercises to check comprehension and other factors are plentiful. The reading ma-

terial is selected from a variety of sources.

The choice and organization of materials in Hovious' text (25), suitable for junior and senior high schools, should produce strong motivation and maintain interest at a high level. There are sections devoted to training in finding main ideas, remembering details, speed phrasing, word meanings, eye movements, skimming, etc. Special chapters are devoted to use of reference aids and to interpretation of tables, graphs and charts. The exercises for "pacing" eye movements are neither necessary nor desirable. Check questions are included in all sections.

In a second book (26), designed for everyone "who would read with greater speed, accuracy, and intelligence," Hovious has furnished additional exercises for improving skill in special aspects of reading such as finding main ideas, following directions, etc. Much space is devoted to training in word meaning and usage. Special attention is given to pronunciation aids found in dictionaries. Tests for comprehension and the like accompany the exercises. Selection of reading material and organization of the exercises are well done.

The list of books designed to furnish material and exercises for the improvement of reading in the junior and senior high school are, as a whole, well done. They differ considerably in type of reading matter selected and in organization of the materials. Some tend to select reading matter of literary merit while others appear to emphasize subject matter close to the everyday experience and interests of the ordinary student. Although all furnish check questions with the exercises, only a few include diagnostic tests. The choice of that text which appears best suited to the needs and aims of the particular school must necessarily be made by the teachers.

There are certain other materials which have been designed or are suitable for improving reading skill. The Thorndike-Century Junior Dictionary (48), in which words are defined in understandable non-technical language, is essential in any junior or senior high school group where remedial reading is taught. Jordan, Berglund and Washburne (27) and Moderow, Sandrus, Mitchell and Noyes (31) have adapted material which is suitable for retarded adolescent readers. Elementary school teachers will find Gray and Liek's Teachers' Guidebook (18) and Yoakam and Bagley's Reading to Learn (54) series of texts useful.

Several trends are discernible in the evolution of diagnostic and remedial reading. At first, under the leadership of medical men, attention was directed to non-readers, or to word-blind cases as they were called. As the educationalists became gradually interested in reading deficiencies, most effort was directed for a time to severely retarded readers in the elementary school. After sufficient experimental data were accumulated, systematic texts in the field began to appear. Emphasis upon methods of diagnosis and remedial techniques vary somewhat from text to text. The evidence indicates that success may be achieved by the use of any one of these outlines of methodology. In all the manuals diagnosis and treatment is aimed at the individual. It is to be noted that motivation is perhaps more important than the particular method employed.

As progress continued, the retarded reader as well as the non-reader began to receive attention. Although most remedial work has been done with elementary school children, a recent trend has been to discover and to remedy reading deficiency among high school and college students.

Lack of materials has been a serious

problem for the remedial teacher. In recently published texts there has been an attempt to remedy this situation by furnishing detailed directions for construction of materials. At the high school level many texts have been devoted entirely to exercises with directions for their use.

In nearly all cases of reading disability prognosis is good. With proper methods adequately applied reading handicaps can be largely overcome or entirely eliminated.

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PUPIL GUIDANCE, WELFARE AND DEVELOPMENT

NEMZEK, CLAUDE L. "The Value of Amount of Tardiness and Absence for Direct and Differential Prediction of Academic Success," *The Journal of Experimental Education*, VII (September, 1938), pp. 4-10.

On the basis of data gathered on 147 boys and 129 girls considering eight variables the author concludes that increased absences and tardinesses seem to decrease school marks; and that for the purposes of differential prediction, the amount of these two factors have negligible value.

NEW TESTS

Chicago City Junior College Placement, Comprehensive and Exemption Tests, by Department of Examinations, Chicago City Junior Colleges. Chicago: Chicago City Junior Colleges, 1938.

Both objective and essay sections of the comprehensive examination are available in the fields of physical science, social science, humanities, English and biological science. An exemption test is given for the field of physical science; and an English placement test completes the battery.

Miami Language Prognosis Test, by R. J. Van Tassel and Leon P. Irvin. Oxford, Ohio: R. J. Van Tassel, Miami University, 1938.

The purpose of this test is prognosis in French and requires 33 minutes for administration.

Remedial Program in Arithmetic: A Self-Instructive Plan of Instruction Based upon Individual Needs, by T. L. Torgerson and M. F. Matthies. Milwaukee: E. M. Hale Company, 1938.

This battery of tests contains 19 diagnostic tests, 5 remedial units, and 25 mastery tests in the fields of division, fractions, decimals and percentage. Teachers manual and class record sheet are also available.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

Yearbook on Child Development.—One volume of the Thirty-Eighth Yearbook (1939) of the National Society for the Study of Education is to be "The Curriculum in Relation to Child Development." The committee in charge consists of Carleton Washburne, chairman; Leo Brueckner; Kai Jensen; Arthur Jersild; Harold Jones; John Anderson; Fowler Brooks; and Ralph Tyler. The contributors include the following: C. O. Arndt, Herbert S. Conrad, Frances M. Dwyer, Paul J. Fay, Frank N. Freeman, Harry O. Gillet, William S. Gray, Ernest Horn, Paul McKee, Norman C. Meier, Ernest O. Melby, Lois Barclay, Etta Schneider, and Ruth Strang.

The Yearbook attempts to gather together all research available at the present time in order to show the level of development necessary for the undertaking of various types of learning and experience. Insofar as possible, it presents data to indicate the arrangement of the curriculum in terms of child development, which is recognized as a composite of biological maturity, experience, and interest, interest perhaps being partly a measure of the other two factors, rather than itself a factor of development.

The volume consists of three parts. Part I consists of an introduction describing the general scope and purpose of the Yearbook, and a long chapter by John Anderson on the nature of child development. Part II includes chapters dealing with the school curriculum from nursery school to college in relation to child development. The volume covers the development of: motor skills, artistic expression and appreciation, reading, writing, language (both the vernacular and foreign), practical arts and skills, arithmetic and mathematical concepts, social science, and the child's emotional life. Part III consists of: a critique of the methods that have been employed in research in these fields, and of suggestions for future research; a look into the future, summarizing the research needed as indicated throughout the Yearbook; and an evaluation from the standpoint of education and child development, by Ernest Melby.

This Yearbook is, so far as the Committee knows, the first book of any kind to deal comprehensively with the relationship between child development and the curriculum. It points out far more problems than it solves, but opens up a tremendous field for research, one which should have great practical value for teachers, administrators, and curriculum-makers.

Yearbook on General Education.—Part II, entitled "General Education in the American College," of the Thirty-Eighth Yearbook of the National Society for the Study of Education, has been prepared by a committee of the Society under the chairmanship of Alvin Eurich. It presents a stimulating and constructive series of chapters on the reorganization of the instructional offerings of the American college to meet the needs of present-day

students. Among the contributors, in addition to the chairman, are: A. J. Brumbaugh and John Dale Russell (University of Chicago), Malcolm MacLean (University of Minnesota), Earl McGrath and Karl Bigelow (American Council on Education), Daniel Prescott (Rutgers University), Homer Rainey (American Youth Commission), Lamar Johnson (Stephens College), Gordon Mackenzie (University of Wisconsin), Donald Cottrell and Ralph Powers (Columbia University), and Henry Wriston (Brown University). The Society will meet in February, 1939, at Cleveland in conjunction with the meetings of the American Association of School Administrators of the National Education Association, where the two parts of the Yearbook will be discussed.

Yearbook on College Instruction.—The 1939 Yearbook of the National Society of College Teachers will be devoted to the theme, "Approaches to the Study of College Instruction." It is the purpose of the collaborators on the volume to describe with illustrative examples factors and considerations which should not be ignored in any attempt at constructive thinking about instruction at the college level.

The Yearbook is not intended to be a manual or discussion of methods of teaching or of course of study construction. Nor is it intended to be a summary of the investigations related to college teaching. Rather its chief purposes are two:

(1) To make clear to college teachers and to the less experienced student of college instruction what considerations must not be overlooked in any sound approach to the problem, and how certain viewpoints and factors necessarily influence procedure.

(2) To furnish concise discussion of the principal types of techniques, particularly those more recently developed, which are being employed to: (a) validate materials and methods of instruction and (b) proceed more or less objectively in the formulation of courses of study and methods of instruction.

Part I discusses the conditioning historical and social background: changes in the type of college student, changes in secondary schools, developments in higher education, and trends in American life. Part II deals with the basic psychological background: principles of learning, personality, interest and motivation, and individual differences. Part III is concerned with approaches to the problems of college teaching: objectives, selection and organization of subject matter, methods of evaluation and appraisal of college teaching, extra-classroom activities of the college teacher, measurement of the outcomes of instruction, and the training of the college teacher.

The committee in charge of the Yearbook consists of: W. S. Gray, University of Chicago; T. E. Benner, University of Illinois; Ralph Tyler, University of Chicago; Donald P. Cottrell, Columbia University; and Harl R. Douglass, University of North Carolina, Chairman.

Studies of the Advisory Committee.—The Advisory Committee on Education, appointed by President Roosevelt, is now beginning to publish the series of staff studies on which its report to Congress in February, 1938, was based. These studies, each covering some aspect of public education in the United States or its outlying possessions, will appear during the fall and winter as rapidly as publishing facilities permit.

Floyd W. Reeves, Professor of Administration in the Departments of Education and Political Science at the University of Chicago, who was appointed Chairman of the Committee, has also served as Director of Studies. Paul T. David, for

merly Economist for the Tennessee Valley Authority and staff member of the President's Committee on Administrative Management, is Secretary of the Committee and Assistant Director of Studies.

The studies for the Committee were prepared by a staff of specialists in various fields of education, economics, and public administration. After the Committee Report was published, authors of the staff studies were asked to prepare them for publication as a series of monographs, in order to make available to the public the great body of information on education in this country collected for the Committee's use. Each study was then reviewed by specialists in the particular field, and the authors were given an opportunity for further revision on the basis of comments received. In some instances it was possible to add later information than that available for the February Report of the Committee.

The studies have been edited and prepared for the press under the direction of Laverne Burchfield, who was formerly editor for the President's Committee on Administrative Management and for several years a member of the staff of *Social Science Abstracts*.

Staff studies which have already appeared are: The National Youth Administration, by Palmer O. Johnson and Oswald L. Harvey; Library Service, by Carleton B. Joeckel; Vocational Rehabilitation of the Physically Disabled, by Lloyd E. Blauch; and Public Education in the District of Columbia, by Lloyd E. Blauch and J. Orin Powers.

Other studies now being edited or in press include: Education in the Forty-eight States, by Payson Smith, Frank W. Wright, and associates; Organization and Administration of Public Education, by Walter D. Cocking and Charles H. Gilmore; State Personnel Administration: With Special Reference to Departments of Education, by Katherine A. Frederic; Federal Aid and the Tax Problem, by Clarence Heer; Principles and Methods of Distributing Federal Aid for Education, by Paul R. Mort, Eugene S. Lawler, and associates; The Extent of Equalization Secured through State School Funds, by Newton Edwards and Herman G. Richey; Selected Legal Problems in Providing Federal Aid for Education, by Robert R. Hamilton; Vocational Education, by John Dale Russell and associates; The Land-Grant Colleges, by George A. Works and Barton Morgan; Special Problems of Negro Education, by Doxey A. Wilkerson; Educational Activities of the Works Progress Administration, by Doak S. Campbell, Frederick H. Bair, and Oswald L. Harvey; Public Education in the Territories and Outlying Possessions, by Lloyd E. Blauch; Education of Children on Federal Reservations, by Lloyd E. Blauch; Educational Service for Indians, by Lloyd E. Blauch; and Research in the United States Office of Education, by Charles H. Judd.

A summary of the Committee's Report to Congress in pamphlet form is also in press and will be available shortly.

Youth Commission.—Since the research program of the American Youth Commission was last described in these pages, the Commission has published the reports of three major studies: its youth surveys in Maryland, Dallas (Texas), and Muncie (Indiana). The first of these is a printed volume, *Youth Tell Their Story*, for sale by the American Council on Education; the other two are substantial mimeographed reports distributed free on payment of express charges. There have also been completed two other studies then in progress. The first is the study of the social and educational aspects of the Civilian Conservation Corps, which

involved testing programs in 238 camps. The second is the national study of the health of college freshmen and of college health facilities. Published reports of these two projects will appear shortly.

During the past year the Commission has undertaken three new studies. The first is an extensive survey of Negro youth, in which the status of these young people will be determined and inquiry made into the effect upon personality of membership in a racial minority. The second, which is being made in coöperation with the United States Employment Service, is a program of occupational research designed to discover and test new and improved methods of vocational guidance and placement. The third project, which has just been begun, is a study of youth-led organizations. It is being supervised by Richard R. Brown. In addition to these activities, the Commission keeps a current inventory of all recent studies of youth which come to its attention, along the lines of its volume, *Youth Surveys—Finding the Facts*, which was published last year.

In addition to the two forthcoming reports mentioned above, the Commission's publication program for the next year includes several studies of special areas of youth problems, prepared for it by expert reporters. These will comprise: "Education in Family Living," by Joseph K. Folsom; "The National Interest in the Education of Youth," by Newton Edwards; and "The Occupational Adjustment of Youth," by members of the Commission's staff. There is also in the press a pamphlet, *How to Make a Community Youth Survey*, embodying the results of the Commission's recent experience along this line.

Annual Report, 1936-37, General Education Board. — The General Education Board in 1937 was thirty-five years old. Established in 1902 by John D. Rockefeller, it was dedicated, in the words of its charter, to "the promotion of education within the United States without distinction of race, sex or creed." The total amount received by the Board in gifts and the accretion thereof, exclusive of income from investments, was $179,754,751. Up until 1920 the Board's expenditures were made almost exclusively from income. In 1920, however, the practice was initiated of spending from principal as well as from income. Total appropriations up to the end of 1937 were as follows: from principal, $139,337,348; from income, $115,997,322; total, $255,334,670.

Roughly speaking, the money was used to stimulate progress in the following fields: medical education, higher education, Negro education, and certain special programs of brief duration or involving smaller sums of money. Of a $28,000,000 balance remaining, approximately $12,000,000 is definitely earmarked for the Board's present programs in southern education, in general education, and in child growth and development. A sum of $7,300,000 has been set aside for unexpected contingencies and for commitments expressed or implied under former programs of the Board. The free balance of funds remaining as of December 31, 1937, is approximately $8,700,000.

In the words of Raymond B. Fosdick, President of the Board: "The life of the General Education Board is therefore running to its close. It is probable that within a few years its funds will be completely exhausted and the organization will be liquidated. The Trustees have felt that, in the rapidly moving times through which we have lived since the War, it was more important to meet challenging opportunities in the development of fields like medical education, for example, than it was to conserve principal funds for some indefinite future. There

are no scales, of course, by which the potentialities of the present can be weighed against those of the future. But the present is vividly here with its needs and possibilities; the future is beyond reckoning, and we of this generation must live in the faith that it will find means to provide for itself. This in brief is the point of view which has led the Trustees to approach the coming liquidation of the General Education Board with the belief that it represents, as far as limited human intelligence can foresee, a socially desirable step."

Secondary School Standards. — The total expenditure for the Coöperative Study to the close of the current year will be approximately $200,000. The regional associations have appropriated about $20,000 of the total amount; the remainder has been supplied by the General Education Board.

By May, 1937, the try-out program in 200 schools had been practically completed so far as gathering data was concerned; tabulating of the results had been started. Since that time the tabulation and analysis of data from the 200 schools have been completed. This has involved intensive work with tabulation of the original data, weighting the various ratings and evaluations, computing scores on features of educational services in the schools by applying these weightings to the evaluations, deriving norms, and preparing scales ("educational temperatures") on the various features in each of the 200 schools.

An important part of the work has been the analysis to determine which of the measures are most discriminative in distinguishing good schools from schools not so good. In part through statistical means and in part through subjective judgment based on extensive experience with the measures, three scales have been developed: A Gamma Scale consisting of the 25 most significant measures; a Beta Scale consisting of the 25 measures of the Gamma Scale plus the 25 measures which are next in significance; and an Alpha Scale of 100 measures which is the most complete and comprehensive measure of the goodness of a school so far recommended by the Coöperative Study.

The policy of releasing information through magazine articles and addresses has been followed throughout the year. Numerous magazine articles dealing with the findings of various phases of the Study have been written and fifteen of them have been given wide circulation through sending reprints to an extensive mailing list of high schools. Many addresses regarding the Study and its findings have been given before educational meetings during the year.

Three major publications have been prepared and are being printed for distribution: (1) The *Evaluative Criteria* (152 pp.) in a revised form; (2) A manual, *How to Evaluate a Secondary School* (172 pp.), intended for the assistance of those wishing to put into practice the procedures for evaluation developed by the Coöperative Study; and (3) *Educational Temperatures* (56 pp.), a book of blank thermometers—however, with the various norms indicated—on which may be charted the scores secured by the evaluation of a given school. All of these publications are thought of as being in tentative form; revision of them is contemplated as a part of this year's work.

The necessity for evaluating schools in terms of their philosophy and objectives has been stressed throughout the whole period of the Coöperative Study. The attempts of the Study, however, to get at the objectives of the schools have not been entirely successful, and as it neared

the time first set for closing up of the research work in June, 1938, it was felt more and more insistently that further work ought to be done in this important area. With the aid of additional appropriations from the foundation and the regional associations, plans are under way for an intensive study of the educational philosophy in 16 schools and of the methods by which schools may be evaluated in terms of their philosophy.

Revision of the materials already developed by the Coöperative Study and preparation of an extensive research volume are other activities for this final year of work. In the process it is expected that further refinements will be made in the *Evaluative Criteria* and the Manual. The evaluation of a number of experimental measures will also take place, with the expectation that some of them may be added to the Alpha, Beta, and Gamma Scales.

One of the most important undertakings of the year involves assistance to agencies and individuals that plan to put the recommendations of the Study into effect. Definite plans for such introduction are being made by at least four of the six regional associations of the United States and by a number of states. The personnel and resources of the Study will, so far as possible, be made available to these interested agencies for advice and assistance.

This information was provided by Carl A. Jessen, secretary of the committees in charge. W. C. Eells is the coördinator of the investigation.

Mathematics Commission.—In 1935 an important development in the field of secondary mathematics was the appointment of a Joint Commission of the Mathematical Association of America and the National Council of Mathematics Teachers. This commission received a grant of $5,000 from the General Education Board. The purpose is to study the problems in the entire field from elementary to collegiate mathematics, to determine the part mathematics should play in general education, and to make recommendations. The commission is to continue the work of the National Committee on Mathematical Requirements. Much is to be gained for mathematics from the recognition that reforms in secondary mathematics are related to the reorganization of elementary school mathematics and that reforms in college mathematics are similarly related to the reorganization of the subject in the high school.

A preliminary report has been issued in two parts. The first deals with the general aims of education and of secondary schools, the role of mathematics in civilization, and the place of mathematics in education. The second part treats mathematics in terms of its curriculum, materials of grades 7-12, modified curriculum plans, the junior college program, and evaluation. An appendix is devoted to transfer of training. The final report will include chapters on the program for retarded and accelerated pupils and on the training of teachers.

The criticisms of interested groups and individuals are invited. A copy of either part of the report can be secured for the nominal sum of ten cents from K. P. Williams of Indiana University who is chairman of the Commission on the Place of Mathematics in Secondary Schools.

Modern Languages. — The Committee on Modern Languages of the American Council on Education has continued its research activities in the field of modern language teaching during the past year with the publication of *An Analytical Bibliography of Modern Language Teaching, 1932-37* (University of Chicago Press, 1938), compiled by Algernon Cole-

man of the University of Chicago. This undertaking is a continuation of two similar publications, published in 1928 and 1933. The work just issued (561 pages) is more than twice the size of its predecessor and records a tremendous development of productive studies and experiments in modern language methodology in the last five years. Again, the greatest number of titles concerns materials and methods, but the reading objective and the standardized test still hold the foreground of experimental interest.

Progress is being made with two major projects: a count of syntactical phenomena in French under the direction of Coleman, and in German by E. W. Bagster-Collins of Teachers College, Columbia. These are going on with the aid of staffs of younger workers on the same general lines as the quantitative study of Spanish syntax compiled by Hayward Keniston (*A Spanish Syntax List*, Henry Holt and Co., 1937). The purpose of these studies is to furnish for teachers and textbook makers objective data for selecting syntax material in place of the traditional and often irrational usages now prevailing.

Last spring the Committee was entrusted with a new responsibility, a study of the teaching of English to students of other speech. *The Interim Report on Vocabulary Selection* (London, P. S. King and Co., 1936) prepared by a group of American and British scholars including Michael West, Harold Palmer, Lawrence Faucett, and E. L. Thorndike, and containing a list of words tentatively selected for simplifying and standardizing oral instruction in English, was a first step in this direction. This report was circulated throughout the world by the London Institute on Education and the Committee on Modern Languages, and will be revised during the coming year on the basis of criticisms received, in part as results of experimentation in the field. It is expected that the list can then be circulated commercially for further use and experiment. For the present year the Committee has undertaken a systematic study of elementary books for instruction of foreigners in English and of the various word lists now available, and the results of this investigation will be published in the spring of 1939. The general undertaking will eventually include studies of the incidence and extent of English instruction in the Spanish speaking states of the Southwest, in Hawaii, Puerto Rico, and in Latin America and Far Eastern areas where American education is influential, as well as among foreign groups in this country. Methods now prevailing and their present results will be supplemented by further studies of material, such as grammatical frequency in English with its implications for more simplified and rationalized methods of instruction. It is expected that these studies will extend over a period of some years and will include fundamental testing and experiment.

In view of this extension of its activities the following new members were added to the Committee: C. C. Fries, University of Michigan, and I. L. Kandel, Columbia University. Other members of the Committee are: Algernon Coleman, secretary; R. H. Fife, chairman; V. A. C. Henmon; Hayward Keniston; J. B. Tharp; and G. F. Zook. The Committee's address is 515 West 116th Street, New York City.

This progress report was prepared by the chairman of the Committee.

American Council on Education.—Two new projects of the Council are concerned with a coöperative study of general education and with implementation of the findings of educational research, as reported in the October, 1938, *Educational Record*.

For several years a group of colleges in the mid-west area have been investigating the possibility of a coöperative study of the problems of general education at the junior college level. Their interest was due, in part, to the success of the thirty-school coöperative study sponsored by the Progressive Education Association. A grant to the American Council of $66,000 over a three-year period now makes the study possible. A planning committee, under the chairmanship of George A. Works of the University of Chicago, is considering the institutions which will be invited to participate. Each school must satisfy several requirements. It must indicate that it is seriously studying its own educational program and that it has dynamic leadership. Each college will contribute $1,000 yearly to the support of the project. The faculty and board of control of each institution must formally express their willingness to coöperate. The central staff, under the direction of Ralph W. Tyler, will be located in Chicago. Although the committee hopes to have representation from many types of colleges and universities, proximity to Chicago will necessarily be a factor in selection.

A number of organizations carrying on extensive programs of educational research have recently come together to sponsor a coöperative investigation of methods of implementing the findings of their studies. The several groups hope to find means of translating the results of important research into educational practice. Under the Council's sponsorship a Committee on Coördination and Implementation of the Findings of Educational Research has been established with the following membership:

Coöperative Study of Secondary School Standards, E. D. Grizzell
Department of Secondary School Principals, Will French
Progressive Education Association, W. W. Beatty
Educational Policies Commission, J. B. Edmonson
Regents' Inquiry into the Character and Cost of Public Education in the State of New York, Luther Gulick
American Youth Commission, Homer P. Rainey
Commission on Teacher Education, Karl W. Bigelow

The Iowa Every-Pupil Testing Programs.—The State University of Iowa annually sponsors two coöperative achievement testing programs, the Iowa Every-Pupil Basic Skills Testing Program for Grades Six, Seven, and Eight conducted late in January and the Iowa Every-Pupil High School Testing Program conducted in the second week of May. The 1938 Basic Skills Program involved the administration of a forty-four page, five and one-half hour battery to over 35,000 pupils in more than 350 school systems, while in the 1938 High School Program over 150,000 one-hour achievement tests in separate high school subjects were administered in 339 high schools. Considerably more than one-half of all high school pupils in the state and more than one-third of all sixth to eighth grade pupils are now tested in these programs each year. Iowa schools in general are thus provided with an unusually adequate basis for educational guidance as far as test data are concerned.

In view of the recent wide-spread emphasis upon quick scoring of tests, one of the most noteworthy technical advances made in the Iowa programs this year has been the use with all tests of a separate answer sheet which may be manually scored by means of a stencil key. This device was used for the first time in the 1938 High School Program and will be used this year with the 1939 Basic Skills

Tests. From the experience thus far gained, it appears that in the typical school situation tests can be scored manually with this device at a lower cost per pupil than by any other method thus far suggested (including machine scoring) and with very satisfactory accuracy.

Plans are now being completed for an important extension of the services provided by the Iowa Every-Pupil Programs. Work has now been started on the construction of a new comprehensive achievement test battery, similar in scope and purpose to the present Basic Skills battery, that will be made available in two comparable forms, an elementary and an advanced form, which together will cover grades three to eight. This new battery will be used for the first time in the January, 1940, program, and a completely new and comparable edition will subsequently be provided each year. The profile chart accompanying this battery will enable the schools to keep a cumulative graphic record of test results for each pupil over a six-year period. This record will thus indicate, not only the pupil's status at any time in each of the various aspects of his educational development which are tested, but also the relative progress that he has made in each of these areas.

The director of the testing programs is E. F. Lindquist, who provided this information.

Chicago Examinations.—Max D. Engelhart has recently issued his annual "Report on the June, 1938, and September, 1938, Comprehensive Examinations and the September, 1938, Exemption and Placement Tests of the Chicago City Junior Colleges."

Achievement in the survey courses of the Chicago City Junior Colleges is measured by means of comprehensive examinations. Each of these examinations is given in two sections, an essay section administered about three weeks before the close of the semester and an objective section administered one week before the close of the semester. In the fields of biological science, the humanities, physical science, and social science, the essay section requires one hour of testing time, and the objective section two hours. The typical essay section in these fields contains a number of exercises which may be answered with a sentence or a brief paragraph, one or two pages of objective exercises, and one or more essay questions requiring the writing of several paragraphs. The typical objective section contains several kinds of objective exercises so designed that the students record their answers on an answer sheet. The inclusion of essay questions and various types of objective exercises in the total examination insures the measurement of a variety of abilities; it would not be justified to use merely the exercises contained in the objective sections of these examinations. However, the restriction of the objective exercises of the objective sections to types which can be scored by means of stencils made from the answer sheets enormously increases the speed and accuracy of scoring. Approximately 5,000 tests were scored and checked by forty clerks in less than three working days. In the future the plan is to use the new electrical scoring machine placed on the market for rental by the International Business Machines Corporation.

Index of Research Projects.—The results of some 2,000 research projects carried on as part of the federal work relief program are summarized briefly in a digest and index which has been published by the Works Progress Administration. This volume of 291 pages contains a concise statement of the principal conclusions of each study and an alphabetical subject index to the contents. The reports on these projects touch upon

nearly every field of natural and social science, and many of them have appeared in the form of articles in scholarly journals. However, several hundred of the reports summarized in this index are in manuscript form, and arrangements have been made with the American Documentation Institute whereby micro-film copies of the original reports will be furnished at nominal rates for the use of research specialists. A small edition of this volume has been prepared for distribution to the larger public and university libraries, where it will be available for reference, and for government departments, industrial concerns, and research foundations. A limited supply of copies of this Index of Research Projects is still available. Requests should be addressed to the Works Progress Administration at Washington, D. C.

The Eight-year Study.—Good brief accounts of the Eight-year Study of the Progressive Education Association and of the program of evaluation, by Wilford Aikin and Ralph Tyler respectively, appear in the *Educational Research Bulletin* for September 21, 1938. The schools participating in the Thirty-School Experimental Study of the Commission on the Relation of School and College are now beginning the sixth year of their work. Superintendents and principals are taking increased responsibility for educational leadership. They realize that their responsibility includes stimulation of teachers and participation with them in the study of the major problems of education. These include the function of the high school in American society, the needs of young people in contemporary life, the changes in the content and organization of the curriculum necessary to meet those needs, and searching inquiry into the meaning of the democratic ideal. Administration is becoming more democratic, and parents, teachers, and students are sharing more fully in the determination of school policies and procedures. Steadily the school programs become more flexible and adaptable to the concerns of youth and society.

The major curriculum developments of the past year are these: serious study of the social implications of subjects as usually organized; change in content of subjects in the light of their social bearings; further search for fundamental bases of inter-relationship of subject-matter fields. Many of the schools have reached the conclusion that the needs common to all students cannot be met satisfactorily through the organization of the curriculum in terms of traditional subjects. Having tried coördination or integration of subjects with unsatisfactory results, they are now making a direct attempt to meet the common needs of students by means of the core curriculum. The term has, as yet, no clear-cut meaning either in theory or practice; however, the following is suggested: The core consists of the school experiences designed to meet those common, recurring needs of young people which may be best organized without regard to conventional subjects or courses.

All are agreed that there should not be a sharp break between high school and college. A student's educational experience should have continuity. How can this be provided? The Committee on Records and Reports, whose chairman is Eugene R. Smith, director of the Beaver Country Day School, Chestnut Hill, Massachusetts, has made further progress in the study of this problem. A form has been prepared, and is being used widely by the schools, to provide adequate record of the student's development in school. This form enables the school to provide the college abundant, significant information concerning the student when he becomes a

candidate for admission to college. The candidate is described in such fashion that the college has the information necessary for determining admission and for guidance of the student after he enters college. This enables the college to select students without requiring a rigidly prescribed curriculum for the secondary school.

The work in evaluation this last year developed to the point where batteries of new-type instruments of evaluation became available to the thirty schools so that it was possible for each school to set up a fairly adequate evaluation program in terms of its major objectives. During the latter part of the year, more than half the thirty schools used the new tests with satisfactory results. They are now able to secure evidence concerning the development of students towards those more intangible objectives about which little evidence has been available heretofore. During the past year the evaluation staff, in charge of Ralph Tyler, has been developing tests in connection with nine major classes of objectives, namely, the acquisition of information, the development of ability to do reflective thinking, the improvement of work habits and study skills, the development of attitudes, the development of interests, the development of appreciation, social sensitivity, social adjustment, and emotional maturity.

Tests relating to information, to study skills, to aspects of thinking, to attitudes, to interests, to appreciations, to social sensitivity, and to emotional maturity were developed and given extensive tryouts in a number of secondary schools. As a result of this effort revisions are being made in certain of the tests, and new forms are being developed for next year.

The major research interest during the year has been in developing more helpful methods for the interpretation and synthesis of test results. Tests have frequently been summarized in terms of a single score and where tests from several fields have been brought together they have usually been synthesized through adding the several scores or by adding some divided scores.

The staff has been working upon descriptive summaries which give a more complete description of the behavior of the individuals or of the group in its reaction to each test and has been developing techniques for synthesizing the results from several tests in such a way as to reveal points at which more information is needed, to corroborate certain major generalizations about the students' successes or difficulties, and to disclose factors which should be given major consideration by the improving curriculums and guidance work. These methods of summarization and synthesis were tried out during the past summer with several groups of teachers to determine how helpful they are and to see how far the conclusions drawn from these test results are corroborated by more intensive case studies.

Study of College Entrance in Ohio.—During this last year the High School Principals' Association of Ohio secured the coöperation of the colleges and universities of the state in a plan by which a group of representative schools would be freed from prescribed college-entrance requirements in order that they may undertake, with the help of the colleges, thoroughgoing study and revision of the high-school curriculum. A committee of principals, with A. J. Dillehay of East High School, Akron, chairman, carried through the negotiations with the colleges. The schools are now being chosen by a supervising Central Committee. Any school in Ohio desiring to participate should communicate with the Executive

Secretary of the committee, Wilford Aikin, Ohio State University. Certain criteria have been set up in order that the schools most likely to contribute effectively to the purposes of the study may be chosen. The agreement with the colleges includes the classes graduating from high school from 1941 to 1949. The schools chosen will plan their new work during this school year and inaugurate it in September, 1939.

Research at Ohio State University.—The *Educational Research Bulletin* for September 21, 1938, outlines effectively the 1938-39 program of the Bureau of Educational Research at Ohio State University, of which W. W. Charters is director.

"Three divisions of the Bureau undertake responsibilities which are primarily service activities. The Reference Division collects research materials for the use of all those engaged in educational research, including members of the Bureau, the College, the University, and the school people of the state. The Bureau confines its cataloguing to materials not listed in the *Education Index*. Nevertheless, twelve thousand cards were added this year. The Appointments Division places teachers. While graduates of the College of Education constitute the bulk of the placements, the numbers of Masters, Doctors, and graduate students who are placed constitute a substantial part of the service. The Editorial Division publishes studies and articles which are produced by the faculty. Unfortunately, as in many institutions, the limitation of funds handicaps the publication program. In addition, these three units carry on limited research programs.

"The other divisions divide their time about equally between service studies and research studies. Service studies include investigations for specific local uses on the campus and in the state. The dividing line between service studies and research investigations is dim because service studies may grow into substantial general contributions and research studies are sometimes of minor importance. Included in service activities are assignments as chairmen and secretaries of committees in which it is expected that the man power of the Bureau will be used to collect and organize data for committee use.

"The Radio Education Division will continue its evaluation activities with the assistance of funds from the General Education Board. This is a national project. The Curriculum Division will devote part of its time to traffic-safety films. Both will bring to a culmination during the year the formation of state units of coöperating agencies in radio education and visual education.

"The Survey Division will continue as in the past to be a trouble shooter for school boards and educational agencies in the state. The public school-relations unit will lend its energies to the Ohio high-school evaluation program while continuing the direction of the National Eight-Year Study of the Progressive Education Association.

"The work of the Evaluation Division will be radically restricted by the change of location and personnel for the Progressive Education Study from this Bureau to the University of Chicago, but the numerous activities of this unit outside the Progressive Education Association study will continue as usual and with more local intensity because of the absence of a subsidized national program. The program of the Personnel Division will be modified from major attention to college personnel to emphasis upon educational and vocational guidance in the high-school and junior-college area."